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PSYCHOLOGY AND PSYCHIATRY[1]

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In the past a number of papers have dealt with the topic assigned to me. With their special views and arguments I shall not concern myself beyond pointing out some of the difficulties that have arisen either because of them or as provoking them. Psychiatrically, some of the writers, not all in the distant past, have identified psychology with one or more psychologists with whom they have come in contact, sometimes in person but usually through their writings. With the psychological views expressed there was no sympathy, since they were considered to be one-sided, or they were thought to show evidence of gross ignorance, or the wording produced anger and was supercilious or overbearing. The psychologist, on the other hand, has sometimes tried to make the term psychiatry synonymous with the ideas and the behavior of one psychiatrist whose superficiality was recognized by his professional confrères, but whose 'holier than thou' attitude or whose expressions of superiority have incited the psychologist to sarcasm, abuse, denunciation, or pity. In some cases, it is apparent that the physician, jealous or fearing lest some of his licensed prerogatives, or lest some of his assumed functions might be encroached upon, or that others might develop a clientele of potential financial value, has set himself upon a pedestal of supposed knowledge of the whole mental and physical

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life and character of the individual. He has charged the psychologist with incompetency in dealing with people, because the latter has not taken the trouble to graduate from a medical college, and because he is not willing to accept uncritically all that the particular psychiatrist believes. The criticizing psychologist, on the other hand, wonders how the physician acquired his supposed superior knowledge of mental phenomena when his medical training of about 4,000 hours comprised instruction in psychology and psychiatry amounting to about 60 hours or less.

Similar personal verbal encounters will doubtless recur and with the same result as in the past. Each of the combatants will have shot at the other without making a hit, and the only difference between such a discussion and a French duel is that after the duel the combatants fall upon each other's neck and kiss. Up to the present time, so far as my knowledge goes, most psychiatrists as such will not kiss a psychologist, nor will most psychologists kiss a psychiatrist as such.

The criticism of individual psychiatrists or of individual psychologists may be a necessary and often a commendable performance to prevent an undue exhibition of what the Freudians call a homo-sexual trend, viz., egotism. Such criticisms, unless the individual recognizes and accepts his temporary position as a patient who is being psychoanalyzed, may be amusing for the spectators, but in the words of the comic supplement "it don't mean anything." Furthermore, the generalization from one case is a recognized method of unscientific procedure which should have no place in either medical or psychological literature.

This is the first point of importance. Let us recognize and remember that there are all degrees of psychiatrists and all degrees of psychologists, that there are differences in specialization as well as in amount of knowledge a man may have, that some of each group are positively ignorant and that others are negatively learned, and that blatancy, obstinacy, intolerance, puerility, and quibbling are neither

characteristic nor absent because of the occupation or title or self-advertisement of the individual. Let us, therefore, confine ourselves to the subjects psychology and psychiatry, and to the psychologist and the psychiatrist in general, and exclude the individual.

Psychiatry is much more easily defined at the present time than is psychology. The facts or conditions that constitute the field of psychiatry are more generally accepted than those of psychology. The psychiatrist is by etymological derivation a mental healer, he is concerned with the cure of those who exhibit 'variations from their usual or normal way of thinking, feeling, and acting.' In practice he also usually deals with feeblemindedness, which is not a deviation from the individual's normal or usual, but a continued or a continuing state. Psychiatry, like other specialized divisions of the practice of medicine or surgery, is an application of facts and principles to certain practical problems dealing with the diagnosis, with the treatment or care of patients, and with the prevention of pathological conditions.

It would be presumptuous for me to try to harmonize the conflicting views of the professional psychologists at this time respecting the definition, the scope, and the methods of psychology. It would not be bravery, but unthinking rashness, to attempt to decide between the obviously opposing views, to decide which is pure and virtuous and which is improper and evil and corruption. I respect the introspectionist's severe individual in the nun's drab habit, I look with pleasure on the ballet dancer of Miss Calkins's 'True Behaviorism,' I see beauty in the Miss Psychology clothed by Warren in the fig-leaf costume, but I also approve what others may call the brazen nakedness of Watson's 'Physiological Behaviorism.' I can see, however, that while the garb is of some importance, more to others than to me, the fundamental is the same. Regardless of the outward coverings, psychology is and her beauty or ugliness is dependent upon the eye of the beholder. She may be described

in terms of brass instruments, or measurements of time and space and energy, as mental science, as behavior, as the study of psychical processes, or as the science of the facts or content of experience, but in every case there is meant what historically and popularly has been known as mind.

With two of the parts or divisions of psychology we must concern ourselves. These are abnormal psychology and pathological psychology or psychopathology. It is these two fields, their relations and dependencies, which give the clue to so many of the disputes of the past, and which if properly understood should bring about a much better understanding between psychiatrists and psychologists.

The field of abnormal psychology can best be understood in terms of the distribution curve. We define the normal as that which is near the average or the medium, and conversely we define the abnormal as that which deviates greatly from the average or the median. Such a definition can be applied to the individual's sense endowment, to his mental processes, to his behavior in relation to his environment, or to social activities. It carries no teleological meaning. It does not say that the things we speak of *should* have a certain extensity, or intensity, or speed, or number. It does not define the thing in terms of 'should be,' or 'might be,' or 'ought,' but solely in terms of 'is.' Abnormal psychology, therefore, deals with the extremes, with the hypernormal traits and individuals, as well as with subnormal activities and combinations of function. The distinction has been drawn that pathological psychology and patho-psychology stress the psychological aspects of the thing under consideration, while psycho-pathology stresses the pathological character. All three terms, however they be otherwise differentiated, involve the concept of disease or disorganization which prevents proper (not the usual or average or the median) function. Normal in contradistinction to pathological means the desirable or the necessary. An individual who shows an intelligence quotient of 20 is abnormal, and he may also be pathological. One who passes the Army

Alpha with a perfect score of 212 is also abnormal, but not probably pathological. The man of 80 who retains the intellectual vigor which he showed at 40 is abnormal, but decidedly not pathological. He who at 80 exhibits mental deterioration shows only what more than 90 per cent of individuals of that age show, but he is certainly pathological.

Psychiatry, as an art or an application of science looking towards the cure of those who are mentally diseased, bears the same relation to the underlying science of psychology as any other technical application bears to its fundamental science. Psychiatry has relations, however, to many fundamental sciences and not alone to psychology. It must take from pathology, from physiology, from chemistry, from bacteriology, and from a host of other sciences what it needs to bring about the desired ends, in treatment or cure, and in prevention. It does need the fundamental facts of psychology, those of sensation and perception, those of action and the will, those of feeling and emotion, those of character and personality, and those of the mental life of the child and of the adult. Regardless of the attitude one may take with respect to the value of dissection as giving facts of functional or use value, it is true that one must know the names, colors, and textures of the parts of which a complex machine is composed before one is able to speak of the spatial, temporal, and forceful relations of the parts.

And it is in just this direction that psychiatry has taken a peculiar slant. Anatomy, physiology, chemistry, bacteriology, pathology, are thought to be necessary preliminaries to the understanding of certain bodily functions with which the psychiatrist must deal, but the psychiatrist usually denies the necessity of understanding the methods and the results of psychology in relation to mental things. Because in a technical psychological journal an article appears which his previous education, or rather lack of education, has not fitted him to read with understanding, he considers the modern laboratory psychology to be futile and entirely unpractical. For him and his work it has no meaning.

But, why should it convey a meaning to him? Is it possible to get for one's work the meaning of chemistry or of physics without special training and study? Is it necessary to assume that psychology and its methods should be simplified to the extent that the reading of an introductory text is all sufficient for the understanding of the details of research? To the last question psychiatry has answered vociferously "Yes," but to the former question psychiatrists are forced to answer meekly "No."

The difference in attitude is understandable when one knows something of the history of medicine. We need consider only one analogy, that of chemistry. The value of chemistry in medical practice has long been recognized, but the advances in chemistry since the time when it was an almost exclusive medical discipline have been numerous and varied. These advances have been due to the development of a group of chemical specialists whose interests have not centered on the diagnosis and treatment of the sick, but solely in the discovery of new facts of a chemical order. There have also developed a group of specialized medical chemists—the physiological or biological chemists—with divided medical and chemical interests, who are the go-betweens or the mediators. They cull from the researches of the silica chemist, from those of the organic chemist, from those of the physical chemist, and from those of other specialized chemists what appears to be applicable to the work and welfare of the body, and they apply this knowledge in their own specialized laboratories. After the intermediary steps have been taken, the results are given to the physician to further apply. A similar division of labor and the steps towards partial application exist between most of the other fundamental medical sciences and the practice of medicine, with the notable exception of psychology.

Theoretically, and to a certain extent practically, abnormal psychology and psychopathology intervene between psychology and psychiatry, but as intermediate kinds of technology with groups of workers they do not exist. A

few are engaged in the fields bordering upon both psychology and psychiatry. Without laboratory training some psychiatrists consider themselves psychopathologists, and there are few psychologists who have adequate training in first-hand acquaintance with the different kinds of abnormalities in the mental diseases.

A psychiatric criticism of psychology that has had vogue is that the psychologist as an analyst has dissected the mind, and metaphorically cut, mounted, and examined it through the microscope, but that he has devoted little or no attention to the interrelations and importances of the things the psychiatrist has seen and described. Because of this psychology is said to have no value in psychiatry. I am quite willing to grant the validity of the conclusion, but I object to the argument. I am quite willing to admit at the same time and in the same sense that anatomy, histology, physiology, chemistry, physics, and bacteriology have no value in psychiatry. The analyses made in these scientific pursuits have only indirect values. The workers have not, and are not expected to have, direct interest in the advancement of psychiatry. It is the right of the psychiatrist to take what he will, or to have it adapted to his own use by another. But even though all of the facts may not be of equal value, and even though we may admit that the anatomical facts of a psychological kind are not equally valuable in the care of the mentally diseased, it is true that some of them must be known and understood. While the analogy is not to be followed out completely it may be said that the psychiatric attitude towards analytic psychology is much the same as that of many drivers of automobiles towards their machines. A few obvious gross details are all they are willing to admit to be necessary for the running of a machine. The places where the feet must be placed, the hands and water and gas, are apparently all that are needed for the operation of the machine in health. It is when the car will not work that its behavior is then described in terms of depression, dissociation, repression, egocentric reac-

tions, regression, and the like. So far, so good, but more anatomical knowledge is needed before the car can be placed in running order. Its anatomy, as well as its physiology, must be partly understood. The reason for some of the common disabilities, such as flat tires and the like, may be learned from a casual anatomical examination, but in those cases in which the driver does not know the difference between the vacuum tank and the magneto, his ability to care for the machine is greatly reduced. When the engine coughs, spits, and stops, the symptoms point to inadequate food supply. But they may also be due to other physiological dissociations. If the psychiatric driver does not know more than that the machine has a kind of catatonic reaction he may spend hours on a lonely road trying to locate and remedy the trouble.

Conversely, the psychologist who knows the weights, the sizes, the shapes, the colors, and the intimate compositions of the parts of a machine will not infrequently find, after the pieces have been laid out and measured, that putting them together again is a task of a different order. He may discover many apparently superfluous parts.

Psychology is, however, becoming more and more dynamic, even in the psychiatric sense. More effort is being made to understand interrelations and dependencies, just as in present-day anatomy it is no longer deemed sufficient to describe and classify but to use the facts to illustrate functional relations. But even though psychology become entirely functional or dynamic, there is no reason to assume that the facts or explanations can be carried over bodily into psychiatry. There must be, in the same way as between anatomy and medical practice, close connecting links. It is here that, in different senses, abnormal psychology and psychopathology belong. They are psychological-psychiatric intermediaries.

In psychology the deviations are of interest because exaggerations and diminutions frequently point out relations that are not obvious in the normal. From the standpoint

of psychology it makes no difference whether or not the abnormality be associated with a pathology. In psychiatry the important thing is the combination of phenomena pointing to disease types, or giving indications of prognosis or treatment. Because in both psychology and psychiatry a knowledge of abnormalities and of pathological conditions are of value, more and more investigations must be made if advances are to be expected. It is here that abnormal psychology and psychopathology find their work. They will serve to benefit both psychology and psychiatry.

Extreme enthusiasm for a cause and an excessive damnation of what is believed to be opposing that cause are characteristic of the fanatic and the reformer. During the past few years there has been an exaggeration of one aspect of psychopathology—psychoanalysis—which in certain quarters of psychiatry has produced a reaction against psychology and which in certain psychological quarters has produced a reaction against psychiatry. But this is the history of many scientific advances. To counteract the many forces advocating cults it is important that both psychologists and psychiatrists study and keep in mind the mental epidemics, and recognizing their virulence and their usually short duration, take scientific hygienic measures to preserve their own mental health and stability. This will best be accomplished when there are more psychological psychiatrists and more psychiatric psychologists, as well as more real abnormal psychologists and more real psychopathologists.

WHAT IS PSYCHOLOGY?[1]

BY B. H. BODE
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In the field of psychology the past two decades have been a period of upheaval. At the beginning of the present century all was peace and harmony within its borders. Psychology had developed an orthodoxy of its own, centering on the belief in mental states and in the efficacy of introspection. No one had the temerity to challenge this faith openly; at most there was an occasional suggestion that the existence of mental states was a postulate which had validity in the realm of psychology, though it had none outside. It was a suggestion that savored somewhat of the scholastic doctrine of two-fold truth; and it served for a time to quiet the misgivings of doubt. But eventually this expedient lost its efficacy, and doubt has become rampant and turbulent. Instead of one universal psychological creed, there are now at least three rival standpoints, each of which claims to have the truth in its keeping. It is my purpose to present and discuss these three doctrines; and I trust that the appearance of dogmatism will be pardoned as unavoidable within the brief limits of this paper.

The psychology in which most, if not all, of us were nurtured is the psychology that defines itself as the description and explanation of mental states or states of consciousness. It is the only one of the three standpoints that has a long and continuous tradition behind it. Its parentage is not scientific but metaphysical. The dualism of mind and matter, which was evolved from theological and philosophical speculation, furnished it with a point of departure and with its fundamental axiom. If we start with the assumption that reality consists of two kinds of existence, or two kinds

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of entities, viz., mind and matter, we are inevitably led to the conclusion that the mind or soul can come into contact with its material environment, not immediately, but only through certain affections or states of the mind known as sensations. These become the immediate objects or content of experience, whereas our knowledge of physical objects, existing independently of the mind, must necessarily rest upon inference.

This implication of the position has led to various strange consequences, which time does not permit us to examine in detail. In the first place, it meant a complete inversion of the standpoint of common-sense. To the unsophisticated person the outstanding feature of sensuous experience is the presence of the physical object. This is what is immediately given, whereas the mind to which it is presented is an exceedingly hazy affair. The common-sense individual has no difficulty in picking out the object of his perception, but he is quite incapable of locating any sensation or perception as a numerically distinct existence. This psychology, on the other hand, can designate the sensation or perception without difficulty, but it is wholly unable to locate the physical object. Indeed, the physical object has logically no status within the bounds of experience. It is a beyond, which eventually turns out to be a realm of utter darkness. Naturally the common-sense person is somewhat nonplussed by this startling result. His very being seems to have undergone an alarming transformation. Even while he is looking on, this too, too solid flesh melts away before his very eyes, and he himself is converted into such stuff as dreams are made of. It is not strange that his sense of reality is offended, or that he wonders, in an inarticulate way, what it is going to profit a man to gain his soul, if he loses the whole world.

The fact, indeed, that common-sense is likely to be displeased is not in itself conclusive. Science has a higher mission than to justify the prejudices of common-sense. But in this case it does raise a presumption against the theory. For, after all, the ultimate ground for this cavalier treatment of common-sense is just the traditional notion that mind and

body are distinct entities. Moreover, the presumption does not stand by itself. It finds considerable support in the fact that the attempt to find a place for non-mental facts, or even for other minds than that of the experiencing individual, has invariably led to a hopeless tangle of inconsistencies. As a matter of fact, in the end even the mind of the experiencing individual himself has to be prevented by brute force from deserting the sinking ship. At the outset the notion of mind seems beautifully clear and simple. It consists of what is immediately given, of colors and sounds and tastes and smells and all the other paraphernalia which collectively are called experience. But as we proceed it turns out that this is not correct. These experiences are held to consist of simpler elements, sensory or affective in character, which are not experienced as such at all. Experience is something that comes into being as the result of the grouping or mixing of kinesthetic and other sensations, which lose their identity in this composite whole. That is, experience is a product or effect. The mind or the mental stuff of which it is composed eludes the foot-lights quite as successfully as the physical objects by which our experiences are supposed to be originated. From the nature of the case, no one can ever say what an unconscious mental state or element is like. And, lastly, this sort of analysis leads nowhere. If we confine ourselves to analysis, pure and simple, we get no points of contact either with the body or with the material environment. Nor, as Watson has emphasized, is it possible for psychologists to exercise any check on one another. Each reports what he finds introspectively, and there the matter ends. There are no objective standards. On the other hand, if it is our purpose to correlate our experiences with objectively ascertainable facts, we seem to get along just as well if we pay no attention to sensations or mental elements at all.

The net result of all of this has been that psychology has gravitated steadily towards a state of innocuous desuetude. As someone has said, it became the science that explains what everyone knows in language that no one can understand. In so far as it secured valuable results—and I have

no wish to minimize its achievements—these results bore no necessary relation whatever to the hypothesis of sensations or mental elements. Eventually the dissatisfaction with its procedure bore fruit in the movement or doctrine commonly known as behaviorism. This doctrine forms a clean-cut contrast with the psychology of mental states. It refuses to have any dealings with mental states. The subject matter of psychology, as it maintains, is not states of consciousness, but behavior. In its hands experience gives up the ghost and retains only such qualities as are tangible or measurable. Visual images, for example, are reduced to eye strains, and the like, and thought becomes a reaction of the nervous system.

On the principle that action and reaction are equal and opposite, it would have been possible, perhaps, to predict the advent of some such standpoint in psychology. To extreme subjectivity it opposes an extreme objectivity; to introspection it opposes the methods of physical science. As a challenge to traditionalism and as a vindication of scientific procedure in psychology the standpoint deserves credit and commendation. But as an interpretation of experience it is just as onesided as its rival and equally bizarre in its results.

To put it differently, behaviorism faces in the right direction when it insists that psychology is a science of adaptive behavior. This new outlook upon psychology, however, is seriously distorted by reason of the fact that it retains the conception of bodily behavior which was held by the psychology of mental states. According to this conception, all bodily behavior can be read off in terms of reflexes. Originally it was supposed that some entity, called the mind or soul, was enthroned in the cerebrum, where it manipulated the various motor centers according to the exigencies of the moment. Later on this soul was replaced by mental states, and eventually the control by these mental states was extensively revised, or even abolished, in the doctrines of parallelism and epiphenomenalism. This revision, however,

did not bring with it any corresponding revision in the belief that reflex action furnishes an adequate explanation of human behavior. On the contrary, it meant the withdrawal of mental states as a controlling agency, and so left everything to reflex action induced by mechanical stimulations. The doctrine of behaviorism has seen fit to adopt the same standpoint. Since it rejects mental states, it has nothing left which could suggest, even remotely, that its industry pertains to psychology. Everything that is distinctive has been permitted to evaporate.

A criticism of this sort is likely to evoke a rejoinder to the general effect that bodily behavior must be construed in terms of reflex action if we are to keep our feet on the ground. Nothing but a rigid insistence on the category of reflex action can protect us against such vagueness and obscurantism as has infested the controversy concerning the freedom of the will. By way of counter rejoinder, however, two considerations may be urged. The first is that conscious behavior stubbornly maintains at least the appearance of being essentially different from mechanical behavior. Moreover, if the explanation of behavior is itself a purely mechanical process, it is not easy to see what validity is to be attached to such explanation. Secondly, the chief reason, presumably, why reflex action seems to be the only category available for explanation is that we are too much disposed to study bodily behavior apart from the experiential situation with which it is correlated. A study of a magnet, for example, that confined itself strictly to the magnet itself would scarcely shed much light on the nature of magnetization. Yet this is the sort of thing to which the behaviorist is led by his innocent confidence in the adequacy of the procedure that is followed by the physical sciences. From the standpoint of physics, the fire that the burnt child has learned to dread is the same fire that it was before. What the behaviorist overlooks is the fact that to the child himself it is nothing of the kind. It is now a fire that will do certain things; it is an object invested with awful possibilities. We do not have simply a more complicated reaction to an identi-

cal stimulus, but a different reaction to a different stimulus. If we grant that this may be a correct statement of the fact, it follows that the new reaction is not necessarily a more complicated reflex. What the nature of the reaction is must then be determined in relation to the nature of the stimulus. The fire perhaps retains a certain fascination for the child; it is an object to be dealt with cautiously, so as to be ready to withdraw at the slightest indication of danger. In other words, the stimulus embodies what common speech calls considerations, which is only another way of saying that both stimulus and response have a peculiar character of tentativeness, by virtue of which the behavior is removed from the plane of reflex action. The behavior is no longer mechanical, but experimental or forward looking.

Since this change in the stimulus has no significance for the work of the physicist or the physiologist, he naturally leaves it out of account. The psychologist, however, is in a different position, since this change must furnish the clue to whatever is distinctive in human behavior. If he surrenders this clue, the possibility of giving a correct account of human behavior is precluded. In adopting the standpoint of the physical sciences, therefore, the behaviorist commits himself in advance to the conclusion that the significant traits of experience are non-existent and that all changes in human behavior must be reducible to complications of reflexes. The distinctive traits of experience are brushed aside, because their presence interferes with the method of explanation that is dictated by tradition and by the analogy of the physical sciences.

The bearing of this self-imposed limitation upon the activities of behaviorism is not difficult to trace. On the side of the body explanation is made to consist in the reference of all activities to certain purely hypothetical patterns or forms of reaction; on the side of the object it consists in the elimination of all traits or characters that do not enjoy the recognition and protection of the physical sciences. This elimination is achieved by the simple process of reducing

them to something else. Such facts as a visual image or a process of thinking, for example, are first related to their physical antecedents or conditions, and when this has been accomplished they are identified with these conditions. A thought is not a thought but a neural reaction. The program of the behaviorist is so engagingly simple because it explains facts by explaining them away.

As was intimated a moment ago, this process of reducing things to something else has been made a familiar story by the physical sciences. When a chemist discovers that water is a product resulting from the combination of oxygen and hydrogen, he is very apt to conclude that water is just these two elements and nothing else. The fact that water has all sorts of unique qualities, such as a certain specific gravity, a certain freezing point, the power to quench thirst, etc., does not enter into the reckoning at all. The chemist can afford to ignore these qualities, because as a chemist he is not directly concerned with them. But if we go outside of this particular area of investigation, this tendency to identify things with their own conditions may lead to serious error. Sometimes, indeed, the unsophisticated onlooker has misgivings that something is wrong, but he is rarely able to locate the trouble. His frame of mind is then like that of the Irish janitor in a chemical laboratory, who, after having the constitution of water explained to him, made the perfectly natural query: "Sure, an' ain't there a divil of a bit of wather in it, at all?"

The reason, I think, why this identification of a thing with its own conditions or causes is so plausible is that it is so easy to shift back and forth. Sometimes neural reactions are the conditions of thinking; at other times they are identical with thinking. This equivocation is an old story in the history of thought; it is only in certain applications of it that behaviorism presents anything that is new. Perhaps a little more reflection on the nature or function of explanation would obviate many of the difficulties and misunderstandings with which we are now afflicted.

This being the situation, what is the remedy? We cannot go back to the traditional standpoint with its dry rot of antiquated metaphysics. But, on the other hand, there is nothing to hope for from behaviorism, except more neural reactions, more mechanism. What we need, first of all, is recognition and acceptance of experiential facts which would be obvious to everybody, if we were not corrupted in advance by antecedent bias. A toothache, an aspiration, an emotion, —these are not neural reactions, let the behaviorist say what he will. They are just what they are, and not something else. I do not question the fact that they are connected with neural reactions, but that is another story. If psychology is to find its way out of the present slough of despond, it must make a beginning at this point. It must take facts as it finds them, and not insist antecedently that these facts are really mental states or neural reactions.

To put it differently, psychology must be sensitive to the endless fluctuations and shadings of experience, not in order to deny them, but to trace out their meaning for the guidance of conduct. Ultimately the only reason for having a psychology at all is to gain insight into the behavior of human beings, as contrasted with that of mechanisms. The difference in the two types of behavior can be ascertained and appreciated only if we direct our attention towards the unique traits of the situation that functions as a stimulus, and not away from them. If we approach the problem in this attitude, we come upon certain significant facts which get no proper hearing on the basis of either of the other theories. We then observe how the present situation prepares the way for the next, how it induces attention, how it selects and rejects, how, in short, it feels its way, step by step, towards an adjustment which the present moment demands and is obliged to find as best it can. This is a type of behavior that we meet with nowhere in the world of mechanism and that can be understood and described only on condition that we emphasize certain characteristics of our environment, characteristics which the other sciences ignore because they are preoccupied with other problems.

The standpoint which I have indicated so sketchily just now is the third possible alternative in psychology at the present time. It too has been sometimes called behaviorism, but it is behaviorism of a different sort. It takes no interest in subjective 'states of consciousness,' and it is interested in neural processes only in so far as acquaintance with these is necessary for an understanding of the control which the environment exercises over the conduct of the individual. Its chief concern is with the unique and irreducible nature of the stimulus, which has been persistently neglected in the past and which is our best hope for a clue to the nature of purposive behavior.

The situation in psychology is most interesting. Psychology has long refused to reflect on its fundamental presuppositions, on the ground that it would enter into no entangling alliances with metaphysics; but this refusal served, in fact, only as a camouflage for its own metaphysical premises and background. But it can no longer evade the obligation to define its problem and its aim. The mechanistic form of behaviorism is a challenge to psychology from within its own household. If the challenge is ignored, psychology may be merged into physiology, on the one hand, and into physics on the other. Its chief claim to be a distinctive and significant science will be sacrificed. What psychology will choose to do under the circumstances no one can foretell; but it has a rare opportunity to exercise a far-reaching influence by showing, through detailed investigations, the meaning of purposive behavior to an age that is far too exclusively dominated by the concepts of mechanistic science.

SUGGESTIONS FOR A COMPROMISE OF EXISTING CONTROVERSIES IN PSYCHOLOGY

BY W. B. PILLSBURY

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The present situation in psychology is an interesting commentary on the possibilities of accepting diverse major premises and of applying them with all seriousness in the development of a science. As compared with twenty-five years ago when I first became interested in theories of psychology, or when I first had sufficient knowledge to be presumably an intelligent witness of the condition, the contrast is striking. Then every one was sufficiently dominated by the assumptions of Wundt and James, which for our purposes can be assumed as in agreement on fundamentals, to believe that a crass materialism as it was then called and a primitive animism were alike relegated to an historic obscurity. It was respectable only to believe in some sort of parallelism and if the actual thought of real causes nearly always took us to a primacy of the nervous system that boded ill for the efficiency of the mental process, still we saved facing difficult questions, and kept at peace with the idealistic philosophers of the day by a facile hypothesis that permitted body and mind to run on along parallel lines without having the one influence the other.

Today all is conflict and we find represented every fundamentally diverse point of view that has prevailed since man began to think. Still the various schools that are represented today are after all only modifications of the schools that have been represented since the beginning of time and will necessarily be represented as long as man continues to be as he is. The history of behaviorism shows that it is the legitimate and direct descendant of materialism. The revival of materialism by Loeb for the lowest forms, where of course it would be readily accepted, led to the application

of the same principles to constantly higher forms, until it was an obvious next step to apply it to man. The behaviorist might fairly claim an agnostic position with reference to the fundamental explanation on the ground that it is a descendant from Jennings's work rather than Loeb's, and that Jennings's work or explanation was a protest against an extreme chemical explanation of the activities of the lower animals. The concepts which it makes primary, too, are instincts and habits rather than chemical reactions or even the activities of neurones. In so far the behaviorist might insist that his explanation is indifferent to the final explanation of reflex, instinct, or habit, and so would accept an animistic or parallelistic explanation of the response, if it should prove necessary to give it.

One may readily see that the behavioristic view is an expression of the same fundamental demands for an explanation of vital phenomena that drove Leucippus to the assumption that mind is a collection of fine and highly mobile atoms, or that impelled de La Mettrie to regard man as much a machine as Descartes had made the animals. The development from Descartes to La Mettrie is almost exactly analogous to the progress from Jennings to Watson, although unlike Descartes, Jennings had no theory, or had propounded none, concerning man and would be undoubtedly ready to accept a complete behaviorism. In all men of this type the essential factor is a demand for an explanation in as simple terms as possible, and the feeling that the simplest thing in the world is the push of one block against another or, in the biological world, the response of a muscle to a sensory stimulus. I suppose that the feeling is shared by all, and that in one attitude, at least, every one would be willing to admit that an explanation of this type would be highly desirable and to give it assent so far as it can be shown to be in harmony with all other factors and considerations.

At the other extreme much the same claim may be made for the animistic belief, although it probably has a less strong appeal for the trained scientist. This can be shown to have just as definite a descent from the Orphic mysteries or even

from the first thinking of primitive man as the behaviorist has from the first prescientific explanation of the atomist. There is no doubt that it is an expression of the anthropomorphic impulse, which in turn arises from the widespread if unanalyzed belief that man knows himself better than he does anything else, better at least than he knows any physical thing or any mechanical force, and that it is always possible to explain everything in the world about in terms of human beings. The attempt to explain man himself in terms of similar human characteristics is just as common and seems to last much longer than a similar explanation of natural forces. Whenever the primitive scientist meets difficulties in explanation he is inclined to introduce into his series a human term to fill the gap. Ancient physiology was helped out by the animal spirits which were the carriers of messages between different parts and seem to have been half way between mere subtle inanimate vapors and living, thinking messenger boys. When the discovery of the circulation and of the function of nerves reduced the field of ignorance, animal spirits gradually disappeared to have their place taken by waves and electric currents. But still there seemed to be difficulties in the explanation of details. There were for years different problems that did not fit into mechanical or other simple explanations, and when these presented themselves the simplest explanation was always to bring in an animate something which might think and make the changes that could not be pictured in simpler terms, by some sort of voluntary decision. Thus the vital force solved in a word the hard problems of Müller who was otherwise a rigidly mechanistic thinker, and the entelechy, which is after all a spiritual or thinking and self-directing agency, solves the same difficult problems for Driesch.

As compared with materialism or behaviorism it seems to the scientific thinker that all forms of animism are at a disadvantage because the final units in terms of which it works are themselves unknown. One could raise this objection with considerable force against the early savage who was explaining physical changes and processes in terms of

his own feelings about himself. He could not say why in the last analysis he did anything, but because he had the illusion of fore-knowledge concerning his own activities he ascribed the same forces and activities to the outside forces. When the modern psychologist attempts to say that instinct is the result of a change wrought in the developing nervous system by the activity of an unknown force similar to himself, he is making an explanation in terms of a force even more unknown than the change which he attempts to explain. The same may be said with greater force of the explanations of the Freudians which consist in placing a second self, by name and admission entirely unknown, in the unconscious, and making that responsible for the activities which are not otherwise understood. It follows the principle of explaining the unknown by the more unknown, and also attempts an explanation of one thing which is by the very fact of attempted explanation admitted to be unknown by a second force or factor of exactly the same type. This is of course on the assumption that the animal is a replica of the human mind.

Whatever one may say about the logic of the animistic explanation, and probably the less said about it the better, it is undoubtedly an explanation that appeals to the multitude and we are all to be counted among the multitude in our blinder and less critical moments. However much we may struggle with the attempt to understand our own selves or the selves of others, we always seem to feel that after all we must know our own selves thoroughly just because they are ourselves and so close to us. When we are told that a reasoning thinking being like ourselves is guiding the development of an embryo, or is formulating our thoughts for us when we are not thinking of formulating them for ourselves, we are not at once likely to ask what is that thinking being, how does it get into the organism, or even how do you know that any thing of the kind would be able to guide the development any more than you can, by taking thought, add a cubit to your stature. Many otherwise careful men do not ask how a self hidden in the basement of the soul could be any

more effective in controlling fundamental activities than the soul which we commonly think we know, but which if we did know would leave no problem open for explanation by the subconscious or unconscious. From all, the suggestion that some thinking being is an explanation of whatever offers difficulty, meets a ready if temporary acceptance. One constantly forgets that the great unknown of modern science is how what we know by name as 'thought,' in spite of the fact that we know it mostly by name alone, can guide a physical force, or in any way manipulate matter. When one says glibly that thought molds a regenerating limb, one is momentarily thrown off one's guard and forgets that you cannot understand and have not yet thought clearly how you move your finger in writing or your tongue in speech.

It must be said then that rightly or wrongly every man is likely to respond both to an explanation in terms of simple physical forces and to an explanation in terms of a known or unknown replica of the human individual with a feeling of assent and to accept either explanation as a real explanation. The fundamental reason for the acceptance of anything as an explanation is that one has developed a habit or that there is a deep-seated satisfaction due to instinct or fundamental nature that makes anything seem settled when it is safely stowed away in some familiar category. We understand by referring the unknown or new to the known and the familiar. At first sight and through racial habit we believe that the two simplest categories of action are the simple thrust of body against body on the one hand and the action of a thinking being in moving his hand or other physical object on the other. The first reference is the one that the materialist asks us to make; the second that which the animist asks of us. We make either with somewhat the same readiness and about the same resulting satisfaction.

If then as crude human thinking machines we are as ready to accept one as the other and are quite as well pleased with one as with the other as the final solution, is there no way of deciding between them? We can at least weigh

the relative advantages. The materialist's explanation (and the behaviorist's is like it) goes as far as it can at the time with the detailed facts at its command and then asserts that with the advance of knowledge the same principles will enable me to explain what is now not clear. Its results are always satisfactory as far as they go in psychology as in biology or in physics. Where adequate knowledge is lacking its answer is an expressed hope that the same type of answer will satisfy, when ready for the as yet unknown. The animistic theory always gives us a word and always the same word as explanation for all problems. It always says some mind like your own does whatever act you desire to have explained. For science this has the disadvantage that it never leads to any further thought. It is a soporific for inquiry rather than a stimulus. It also has the logical defect of assuming that its answer is itself a known term, when it is merely the great puzzle of all time.

The two explanations are different, too, in that one always satisfies up to a point and while it may make hypotheses from that point on, it is willing to admit that they are hypotheses which need amplification as well as justification. It succeeds very largely by positive contributions and its arguments are always positive arguments. It points to what it has already done as a warrant for confidence in the results that are to come. The arguments of the animist are nearly always negative. He points out the failure of the mechanist beyond a certain point, and then says that since this poor fellow has failed here he can no longer be trusted. My wares may have little to be said for them, but your instincts incline you to accept them, and the failure of my antagonist leaves you no alternative.

One may reduce the conflict between the various forms of structuralism and functionalism to a similar impasse. All mental problems, like all physical problems, may be approached either by asking what a thing is or what it does. Most minds insist on asking both questions. The latter question has a definite answer. Whether there be light or mind the fact that we are illumined is not to be doubted.

What it is that is the substance behind the enlightenment, physical or mental, is not so easy to come to grips with. Whether the ether or electrical oscillations of some type is to be the explanation varies with the fashions. Still almost everyone seems happier when he has something substantial to act with or upon as well as action itself.

Similarly there can be no doubt that I withdraw from certain things and approach others and that the withdrawing is correlated with an intellectual functioning different from that which accompanies the approaching, although time and again it has been questioned whether a structural element of pleasure or pain has a real existence. On the intellectual side too there seems little doubt that in some way we can intend and mean, can designate and be aware that certain things are true, while there is skepticism on the part of many as to whether a mental element exists and exactly what it is if it does exist.

I am not holding a brief for either functionalism or structuralism any more than for animism or behaviorism or materialism. My only point is to insist that these problems are real problems, that as problems they are unsolved, probably insoluble since they are rooted in attitudes of mind which all possess and which are largely incompatible.

My answer then to the question asked in the title of the paper is a negative. The conflicting tendencies are not to be harmonized. They are differences that have existed since the beginnings of thought. They are not amenable to investigation, because they are not matters of fact but of attitude. The conflicting attitudes are rooted in something like instinct or in the nature of things themselves and of the thinking beings that have been evolved because of the nature of things.

You will notice that most of the discussion about these fundamental positions is not logical argument but emotional exhortation, not so much evidence in favor of one's own view as denunciation mixed with ridicule of the other's view, and not infrequently of the other who holds the view.

It is not to be denied that these discussions contribute to the gaiety of nations or at least to the interest in meetings of psychologists, and this interest now and again leads to investigations that are not without value in advancing the science. Still they decide nothing, certainly not the point at issue. The dogmatism of one side usually breeds a more vigorous action on the other. The bad temper engendered is mostly pure waste and if the time and energy used should be devoted to the accumulation of data, the science would advance more rapidly. Still I have no confidence that controversy in these fundamentals will ever cease. Probably it would be a dull world if it did. All that can be desired is that one should have serious moments in which one can look *sub specie æternitatis*, and see that it is a game that must be played because man is what he is, not that the result which is foredoomed to be a draw will make any great difference to the actual content of the science. The nature of man is the same whatever we call it, and the facts we enumerate and describe are the same no matter into what categories we fit them.

AN ANALYSIS OF PSYCHOLOGICAL LANGUAGE DATA

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I. The Problem of Language.—If we include under the heading of language all of its varieties of expressive and communicative behavior we will find language to be not far from our most pervasive form of action. Not a moment of our lives passes but that we perform a great many language reactions, either alone or in conjunction with other types of behavior. Consider that language reactions comprise not only speaking and reading but also are essentially involved in such complex behavior as musing, desiring, thinking, dreaming, planning and willing; in fact we might say that language responses not only constitute important exclusive adaptations to stimuli but parallel and complement almost all of our complex behavior.

And yet it is not incorrect to say that such widespread and important reactions as language consists of, have not been adequately treated by psychologists. True it is that Wundt has given us a two-volume treatise on language, but unfortunately that writer was mainly interested to place a structuralistic psychological foundation under the data of the philologist with the consequence that the treatise does not handle the facts of language as specifically psychological activities but rather as external manifestations of mental states or the social products of psychic processes. Likewise, the behaviorist has recently given some prominence to discussions of language, but he again has been merely concerned to establish the objectivity of thought by identifying it with expression; so that the behaviorist just as much as the introspectionist has foregone the treatment of language as distinct concrete adaptations to stimuli along with the other types of psychological reactions. In view of this situation

the writer undertakes an analysis of language reactions as prominent and significant data of objective psychology.

II. Differentiation of Psychological from other Language Data. (1) *The Anthropological Data.*—Close study of language phenomena impresses us seriously with the extreme necessity of differentiating the psychological facts of language from other language data, for obviously, language phenomena constitute the subject-matter of several humanistic sciences. Is not language just as essentially a cultural fact, a matter of historical development, of social custom as it is a series of specific responses to particular stimuli? Now it is precisely the circumstance that language belongs to different domains of investigation which makes it difficult to keep separate the different approaches to language study, but which at the same time makes it so rigorously imperative that such a distinction between different data be observed. Penalties in abundance pursue us when we confound the different types of language data, for then we almost inevitably misinterpret our facts. When we ask what it is that makes especially difficult the distinction of psychological language from anthropological language we find this answer, namely, that the data of anthropological language, that is to say, language customs and traditions, constitute genuine though potential phases of psychological behavior segments, to wit, stimuli to language responses. To be more explicit, it is undoubtedly true that when individuals are about to develop language reactions such development is subject to the conditioning pressure of customs and institutions developed by their groups, but until such institutions actually function as stimuli to language behavior they cannot be called psychological facts. The difficulty in keeping anthropological language in the form of institutional and cultural entities distinct from psychological facts arises from the circumstance that group language institutions are often activities, but be it noted that such behavior must be looked upon as the abstracted activities of groups and their various influences upon one another and not as the concrete responses of persons to specific stimuli.

(2) *Philological Language Data.*—Much the same care employed in distinguishing between the psychological and anthropological phases of language must be exercised in keeping distinct the psychological and philological aspects. For philological data and interpretations have to do mainly with fixed forms of socially prevalent language institutions and their periodic variation[1] and not at all with the concrete forms of language responses such as especially concern the psychologist. And so we may say that the philologist gets no closer to the psychologist's data than does the anthropologist, although the philologist may be exclusively concerned with the facts of some particular language, and not languages as social institutions. That is to say, the philologist may also deal with the institutional stimuli of genuine language reactions but this is only one kind of language fact, and one which, unless it is contained in an actual response situation, or behavior segment, consists of conventions of speech rather than speech itself. When the philologist's material is not part of a behavior segment, such as the contents of a book when it is not being read, this material may be considered as a physical object exactly like any other kind of physical thing. Not incorrect is it to say that the philologist is interested in evidences of speech, spoken or written, as well as in standards of speech and only very remotely concerned with the psychological adaptations constituting language behavior, for the latter involves much more than is comprised in customary speech. To be brief, the philologist is essentially interested in fixed modes of phonetic systems and their symbolic representation and not in actual responses to stimuli.

Because the philologist is interested in conventional sounds and their symbolization his data and interpretations cannot be directly accepted by the psychologist. In the first place, many of the philologist's problems fall without the province of psychology since they have developed entirely as historical facts; among such facts are the problems of gender, the development of inflection or analysis and the absence of

[1] As exemplified by such laws as Grimm's, Grassmann's, Verner's, etc.

words expressing abstract ideas. In the second place, the philologist is moved by his interest in the conventional to exclude interjectional reactions or to think of them as evolutionary prototypes of standardized speech, in other words, to place too great emphasis upon standard words whether as roots or affixes or as combinations of the two. And in the third place, the philologist assumes that language is a series of symbols for the communication of ideas through definite and even logical vehicles, namely, sentences. To accept the philologist's material manifestly would put the psychologist at a great disadvantage for it would cause him to overemphasize the crystallized products and results of historical reactions and to pay scant attention to actual present behavior.

(3) *Psychological Language Data.*—In striking contrast to both of the above treatments of language, the psychologist must look upon language as a series of intimate actions of particular persons, speaking, reading, listening, gesturing and interjecting, in short, adaptive responses.[1] As a student of language the psychologist is not interested in the existence of language or languages even when those are considered as reactional products. That the psychologist's interest in language is a much more particularized one appears from the fact that even when the work of the anthropologist and philologist overlaps that of the psychologist, that is to say, when the former scientists handle language as psychological phenomena, they deal with transmissive action only, while the psychologist, on the other hand, must carefully take note of the receptive aspect of language also, to wit, the receiving response actions of language behavior.

In sum, from the psychological standpoint language comprises various sorts of adjustmental behavior, diverse adaptations to surrounding stimuli. Such reactions, in common with other types of psychological response, serve as definite

[1] And so it is entirely incorrect from a psychological standpoint to define language as "a system of signs, different from the things signified, but able to suggest them" (James), for while this definition does touch some psychological language facts namely, signs, it excludes the essential features of language and replaces them with the data of philology.

means of accomplishing specific results. In consequence, for the psychologist language reactions are unique personal and practically serviceable or expressive reactions. Whatever is common or standard about such behavior is due entirely to the commonness and institutional character of the stimuli which condition the acquisition of the specific phases of language reactions and which call them out when they are acquired.

III. What are the Psychological Characteristics of Language?—Our first approach to a psychological investigation of language forces upon us the conviction that language is far from easy to define and therefore it is essential that we formulate as clear a criterion as possible to mark off language responses from other kinds of action. Upon reviewing many facts of language, we do arrive, however, at this distinguishing mark which we believe rather definitely divides off language reactions from other kinds of psychological facts, to wit, that language reactions are inherently indirect or referential adaptations to stimuli.

In order to examine and establish this criterion it is best first to contrast language reactions with some of the most direct and immediate forms of responses. Such direct responses are illustrated by simple reflex action or complex esthetic reaction to a picture or other work of art, as well as thinking about some thing or person. Such acts have no further reference to present or non-present objects or persons; nothing else but the one directly functioning stimulus and response is involved in the behavior segment.

Generalizing the fact of indirectness of action which characterizes language behavior we might say that language involves at least two stimuli, one the adjustment stimulus, the thing, event or person talked about, referred or otherwise responded to, and the other the stimulus object or person provoking the action, whether talking, thinking or some sort of overt behavior.

Illustrative of the indirectness of language behavior is the ordinary conversation or communication reaction. 'A' desires some object picked up; he therefore offers 'B' a verbal

or gestural stimulus which we may call the auxiliary stimulus, and which serves as the means to bring about 'B''s reaction to the book which may be called for our present purposes the adjustment stimulus. What is essentially language in this situation is the indirect action which 'A' performs with respect to the object picked up. The specific means by which the indirect reaction is accomplished, whether through spoken words or pointing gestures makes no difference so far as the language features of the situation go.

Perhaps more clearly can we appreciate the operation of the indirect response when we alter our point of vantage from that of the speaker or the person who uses the language as an instrument to bring about an indirect response to a stimulus object, to that of the person who is involved in the actual carrying out of the reaction. Now while the second person adjusts himself directly to the stimulus object, say a book that he was told to pick up, he at the same time is involved in an indirect response to the request or speech stimulus.

But here we can imagine someone saying, "Is this action of picking up the book not a direct response on the part of 'B' to the request of 'A' as stimulus?" Considerable ambiguity we must admit to exist here, but we believe only with respect to the name of the stimulus. For observe, that it is hardly probable that 'B' is in fact performing a direct action to 'A,' but rather to 'A''s request. But if the latter is true, then because the action of 'A' (the command) is a referential act, 'B''s response itself cannot but refer to the book and hence the request is only an auxiliary stimulus, and if we do not allow this then we may still say that the person who gives the command is not like an ordinary natural object in his rôle as stimulus. To an ordinary natural object we can only perform direct action, both where the object serves as a substitution or as an adjustment stimulus, while in the case of the person his significance as a stimulus lies precisely in the fact that he can refer to things aside from himself by means of conventional signs, which he and those with whom he communicates, have developed in common

social situations. The two stimuli can equally well be analyzed when the person talks to himself as when he is reacting to another person. That means to say, that when I speak to myself about myself I am both adjustment and auxiliary stimulus to myself as acting person. Again, when I perform a direct reaction to some object, say a fright or startle response, to an automobile which barely misses striking me, that object or the accident situation may be both auxiliary and adjustment stimulus for a secondary or indirect reaction. It is possible of course that we can react directly to persons as we do to natural objects but in this case we should not attempt to consider any phase of the situation as language.

Whilst the form of language which we have just been discussing and which we name communicative may fairly be called typical it is not by far the most important or the most widely prevalent of our language behavior. But certain it is, however, that in all behavior properly denominated language we can distinguish the two stimulating situations or circumstances. And upon the particular mode of contact with these two stimuli we can in our opinion establish the criterion of indirectness for language reactions.

Two types of indirectness or degrees of language reactions may be distinguished upon the basis of what might be called from a biological or social standpoint the absence of direct adjustments to stimuli, or perhaps the absence of any overtly adjustmental behavior. To illustrate, language in the form of casual conversation may be considered from a biological standpoint as not adaptive at all, while language in the form of instructions or commands may be thought of as indirectly adaptive from the same standpoint. In general, we might name the two degrees of indirect action (1) mediative and (2) referential language. The criterion for distinction is the closeness to a direct response, the referential being the farthest removed. And so we might consider as referential all the language behavior which we call ordinary conversation and the exclamatory reactions which substitute for direct reactions. Now although it is true that in the case of some referential behavior a direct reaction to a stimulus is out

of the question, in the sense that it need never occur, as for example casual conversation, still the criterion of indirectness is just as valid in such cases as when some direct reaction is possible. Under the division of mediative behavior we can place all the language reactions which are in some form or other connected with direct reactions, that is, those responses which are instrumental in provoking direct action or closely associated with it.

Since in practice language responses may be said to be related to direct action in four ways, namely, they may precede, accompany, follow, or substitute for direct action, it may serve to illustrate the indirect character of language reactions to discuss briefly the four different ways in which language behavior operates. We will find that the language responses that precede, accompany, or follow direct action belong under the mediative heading, while the substituting type of language reactions we will call referential, in that it need not bear directly upon any direct action.

(*a*) *Language as Preceding Reactions.*—Various forms of preceding language responses may be isolated. A very clear-cut case is that in which language is used to induce some one to perform a direct action upon some object. Here we have the ordinary case of instructional or directing language. We may call this a practical or instrumental use of language. In other cases our preceding language may be the overt or expressed wish, hope, or plan to perform some action with respect to some stimulus object or situation. While for theoretical purposes there is no difference between this expressive type of language and instrumental speech, in our practical circumstances their variations turn out to be quite significant. And this is true whether or not the preceding indirect language act is or is not followed by direct action. In case the direct action does not occur or in case there is a definite certainty that it will not occur we must place this preceding act in the class of referential language.

(*b*) *Language as Accompanying Reactions.*—To illustrate language as accompanying or simultaneously occurring indirect reactions we may take the case of responding to a

picture by way of admiration or contempt and at the same time voicing or otherwise expressing or indicating what our direct response to this object is. Here of course the direct response may be the person's own thought or feeling responses which are accompanied by language expression.

(*c*) *Language as Following Reactions.*—What in many cases is very close to accompanying reactions may actually be indirect following responses and which may be very definitely determined by preceding direct responses. Exemplified are succeeding indirect responses in the act of telling someone what effect some object or situation has had upon one. The student who imparts to one of his companions the pangs he suffered during an examination is performing definitely succedent indirect reactions which are quite different from those indirect reactions which we assume to have accompanied the actual taking of the examination. To sing by way of glorifying, or bewailing what has happened are also indirect succedent responses. Of these succedent responses a large number may be subsumed under the heading of reference language reactions.

(*d*) *Language as Substitute Reactions.*—Let the reader observe that as a matter of fact our four conditions of indirect action resolve themselves into two general conditions. Indirect action (1) associated with (preceding, accompanying or following) other responses and indirect action (2) substituted for direct action. Our three aforementioned language types, as we stated in the beginning, belong of course under the first or associational heading and now we must illustrate indirect responses which substitute for or replace direct action. Substitutional language does not influence or need not necessarily have any influence at all on any direct action, nor on the other hand need such language itself be influenced by direct action, while in the associative type of language there may be such an influence. As an example of substitute reaction we may take the case of the person who, instead of rushing in to a burning building to rescue a child, may just exclaim in a variety of ways what he sees.

The indirectness of language responses as we have been attempting to establish it, can be very readily and very convincingly observed during the formation of language habits by the infant.[1] The observer must be struck with the differences between the language responses and the necessities and desires of the infant as well as with the specific responses of the infant in satisfying those wants or of the person who aids in their accomplishment.[2] The indirectness of the reactions can perhaps no better be established than by the reflection upon the numerous ways in which the language reaction can be carried out, especially if we consider the different language reactions of different groups and the varying language responses of the members of any given group.

Lest our emphasis of the indirectness of language reactions be thought too persistent we proffer the defensive suggestion that because our task here is that of definitely marking off one type of psychological response from other sorts of psychological behavior, we cannot be too exact in our descriptions. Especially is this true since not only are language reactions, like all other psychological phenomena, specific responses to particular stimuli, but they are not always morphologically different from other types of behavior. Of a surety when we think of verbal responses as language we cannot make many mistakes in differentiating what is, from what is not language, but just as surely must we realize that verbal responses are not by far the only kinds of language reaction nor are indeed verbal reactions always language activities.[3]

More essential still does it appear to us to specify what are the differences between language and other psychological behavior because we summarily reject those traditional con-

[1] See Watson's excellent description, 'Behavior,' 1914, p. 329 ff.

[2] It is for this reason no doubt that Watson calls language reactions substitute responses, cf. 'Behavior,' 1914, p. 329 ff; 'Psychology,' 1919, p. 319 ff. We do not believe that substitution is a general characteristic of language reactions although such a description fits some language types.

[3] For example, naming an object may no more be a language reaction than looking at it for all the laryngeal processes involved.

ceptions of language which make it, from a psychological standpoint, into either (1) mental states called meanings, which are transferred from one mind to another, or which are aroused in one mind by another through the medium of speech, or into (2) verbal or other physical manifestations of various sorts of mental states. From our objective psychological standpoint language cannot in any sense be considered to be a series of ideas or the expression or communication of ideas or other mental states.

To conceive of language as definite behavior phenomena not only gives us a much closer approach to the actual workings of such facts but it also enables us to include under the category of language, and to provide descriptions of, many sorts of specific adaptations that would otherwise be excluded. As to the first point, consider that we avoid completely such embarrassing problems as how it is possible for the same physical material (sound waves or light waves) to produce such different effects as do sensory and verbal stimuli.[1] Such problems the mentalist must face because he takes the media of stimulation such as light rays and air waves to be the stimuli themselves and so he must struggle to find a way out of this inexplicable situation.

When we think in terms of specific reactions to particular stimuli, whether persons, objects or events, we cannot subject ourselves to such insoluble enigmas. On the other hand, by rejecting the conception of language as an external manifestation of some kind of thought process we remove the necessity of limiting language action to such behavior as can be called intellectual or cognitive. All language need not fall under some sort of cognitive category as is the case when the declarative sentence is presumed to be the typical language function. By the same token language cannot be made into exclusive emotional or feeling expressions nor yet into expressions of merely the two kinds of states or experiences. Most serviceably and most validly must language reactions be considered as just such behavior phenomena as they happen to be, depending upon the way the stimulating

[1] Such a problem is raised by Warren, 'Human Psychology,' 1919, p. 321.

situations condition them. From this standpoint the language reactions may be named in any way esteemed suitable by the consideration of the behavior situations in which they operate.

With a myriad voices, though with no intention at all has philological science as well as popular thought celebrated the indirectness of language reactions. This characterization of indirectness has been achieved by looking upon language responses and their graphic representations as symbols of meanings and as indicators of concepts or ideas. To us it is manifest that no matter what view we take concerning the nature of concepts or ideas we must consider them as forms of implicit or incipient processes. For our own part, of course, meanings, ideas, and concepts are also definite forms of psychological responses. That philological science and popular thought do not intentionally make language into indirect behavior we say, because as a matter of fact the symbolic character of language does not lie in any reference to mental or psychic processes as popular psychology would have it, but rather in the instrumental or mediative function of language responses. Not all language is meaning behavior, but it is true that an exceedingly large amount of our language reactions serve as means or instruments for bringing about or for carrying on other types of action or otherwise accomplishing our purposes; so that the referential or indirect character of language has been generally observed and recorded.

How such observations were made we may infer from the fact that when anyone speaks of things or events not present, or asks someone to do something, he must surely note that his action is indirect and referential with respect to the absent thing or the thing the other person acts upon. Were it generally appreciated that ideas and concepts are merely implicit reactions to stimuli, that is to say, actual responses, then it might be overtly appreciated that language constitutes indirect reactions connected with concepts and ideas as direct responses to the same stimuli objects. But whether concepts, meanings and ideas are properly or im-

properly defined in popular psychology, the very fact that they are connected with language indicates clearly that language is fairly universally recognized to be indirect behavior, especially when the popular view concerning ideas and meanings are correctly interpreted, which means for us interpreted as definite behavior acts.

But here a very important problem presents itself, namely, the connection of language and ideational or thought processes. How are these processes in fact related? Are they perhaps identical? Such an identity indeed suggests itself through the circumstance that both thought and language are mediate activities. Recently this identification has been very strenuously urged in an attempt to show that thoughts (concepts, ideas) are not mental substances or psychic processes. Certainly from an objective psychological standpoint thought cannot be considered as anything but adaptational responses to stimuli. Because of the close relation and apparent similarity between thought and language it will add greatly to our understanding of language to compare it with thought processes and if it is not identical with it to mark it off definitely from thinking. To the study of this relation between the two kinds of behavior we devote the next division of our study.

IV. Distinction between Language and Thought.—That thought and language cannot be identified must appear a most valid conclusion to anyone who reflects a moment upon the actual behavior types which are represented by these two psychological terms. Consider that the term thought covers a large range of psychological activities, such as planning, problem-solving, judging, evaluating, inferring, etc. Can anyone meaningfully assert that these forms of complex reactions are language responses much as we may employ language behavior (though perhaps no more than all other sorts together) in accomplishing such responses? Only a moment's reflection is sufficient to recall most convincingly that the various forms of thinking involve so many and such peculiar contacts with stimuli objects of all sorts, and with instruments for handling them, that it is impossible to

call all such reactions language or even apply the term language to the typical phases of such activities.

In short, to call thinking language means rashly to overlook all the myriads of differences in the behavior situations. To name only one fact, is not language most typically, though obviously not exclusively, responses to persons as stimuli, but who would say that our thinking need necessarily have any close reference to persons or human affairs? Possibly one might be misled by the great place which printed and written materials play in our complex thinking and planning in the form of notes and records. To make the use of these verbal notes a basis for confusing thought and language is a grievous error. In the first place, what right have we to confuse verbal tools used in the process of thinking with that process or action, any more than we have to identify with thought itself any other tool (of which obviously there exists a great many) used in thinking. And in the second place, such a confusion of the records of thought with the activity of thinking itself is to mistake word symbols (which are no more language than any other sort of symbols) for the actual psychological process of language.

No one can deny that language is a most useful tool for the operation and development of our thinking; yet we must be so impressed with the fact that there are other modes of action which can be used in the planning, inferring and other thinking acts that we perform, that we cannot in any sense admit any general identity between language and thought. Even if we should admit, as we do without hesitation, that in some cases (perhaps not rare instances) the thinking and planning is purely linguistic (vocal or non-vocal, overt or implicit) we yet cannot allow the general identification, because thinking and planning may just as well consist of other kinds of reactions as well as words, or other kinds of language. Now as a matter of fact, in all cases of important or crucial thinking we have, since such behavior is initiated by and operates under the auspices of very complex situations, a host of reactions occurring, some of which may

be language responses, but certainly include others which are not.

If it seems plausible at all to believe that thinking is not language, even when we add that it is not always nor necessarily so, then we might see further ground for rejecting the identification from the fact that certainly language operates along with, or in the service of other forms of adaptational behavior, besides thought. For instance, in communication we use language to inform others of what we desire, hope, fear, and do (in the form of overt action) as well as to make known what we think.

Assuming that we agree that we cannot identify thought and language responses because each of these classes of behavior refers to what are on the whole intrinsically different adaptational functions, then of necessity the two types of behavior are different in the specific way that they operate. Unlike language responses thinking reactions are direct adaptations to stimuli, although some form of thought action, especially simple implicit behavior, appears to be indirect. It is this fact of the misconstrued indirectness of thinking behavior (since there are a great many of the apparent indirect types of thinking) which no doubt is in great part responsible for the identification of language and thought. In three general ways, then, can thinking acts appear indirect, each of which we must examine in turn in order to determine the exact relation of thought to language.

1. Because much of our thinking represents delayed forms of behavior, that is to say, because many specific reaction systems operate in conjunction with a number of different stimuli comprising the different angles of the thinking stimulus or situation, these specific responses may appear as indirect, but such is in fact not the case. Let us examine the possible reasons for such a misapprehension. In the case of thinking behavior there is present a temporal and spatial element involved in the complex action of responding to the various stimuli provoking the thinking response. The hit or miss character of thinking implies such a condition. For instance, a man determining in which of many manners he

can best ford a stream must probably make several movements or take several moments to decide upon the best way of doing it, but his reactions to these various stimuli are purely direct. On the contrary, in language behavior the one or the very few acts comprising the segment of action will all be indirect actions as we have indicated in the preceding section. The temporal disparity between stimulus and response which in thinking behavior provokes the opinion that such action is indirect when it is really direct, is wholly lacking in language behavior where the action *is* always indirect.

2. Again, thinking reactions may appear indirect through the fact that when they are most serviceable as adjustment responses they operate as precurrent thinking or planning reactions. Such reactions pave the way for a later reaction which will result in some definite change in the condition or existence of the adjustment stimulus object. The point is that thinking either precedes an overt action in the sense that the planning and deciding are accomplished before any actual work is done upon the objects and events with reference to which the thinking was done, or in a single segment of behavior the thought as a precurrent reaction system precedes the occurrence of the final or end reaction which it indeed conditions. In many cases, too, the characteristic of indirectness is attributed to thought reactions because no overt act at all need follow the implicit behavior. Our present interest is to point out that the implicit activity preceding overt action is in truth a direct response to the adjustment stimulus but because this reaction has to be aroused through the intervention of a substitute stimulus the immediate reaction must be thinking or implicit activity. But notice, that when the thinking or implicit reaction occurs, no matter how long before the overt act, it is itself a direct, though non-explicit response to the original or substituted-for object or situation.

In the case of language, on the contrary, our study has shown us that the adjustment stimulus object may be present and frequently is, when the language response is made, but the reaction to that object is referential and not direct. This

is true because the final response can only be made through the means of an auxiliary stimulus. At this point it seems only fair to admit that possibly our term indirect does not fit language responses any better than it is suitable for thought reactions, but there is no question concerning the fact of difference in the two cases irrespective of what name is employed to express that difference.

In the attempt further to elucidate the differences between the actual indirectness of language reactions and the apparent indirectness of thinking reactions it might not be impermissible to digress a moment in order to point out that although the temporal relationship of stimulus and response is not a criterion of indirect behavior still it is evident that the various instances of indirect reactions (language) may be differently conditioned by the temporal relation of response and adjustment stimulus. That is to say, the degree of indirectness depends upon whether the indirect language response follows a direct response or an implicit response. If language is associated with an implicit response the degree of directness or indirectness with respect to the adjustment stimulus will be greater than if it follows an overt reaction. As we have just stated it so happens that in most cases of implicit behavior the adjustment stimulus is responded to through the mediation of a substitute stimulus other than the adjustment object, and thus it happens that when an indirect language response follows an implicit action the person is doubly removed from the adjustment stimulus. This means, then, that in this instance there is a greater temporal interval between the connection of the language act and the adjustment stimulus than in the cases in which the language acts follow overt responses. If we may call any language response a response of second intention, then possibly it will not be unfitting to call a language response associated with an implicit reaction a reaction of third intention. Possibly an illustration might assist in clarifying this analysis. A person burns himself on a hot iron and his immediate and first response is a withdrawal act (reflex). Immediately following the reflex act he makes some language

responses (indirect) expressive of the pain he suffered. In this case the language activity follows an overt act (reflex) and is thus a language response of second intention. Later, this same person recalling the incident (implicit activity) communicates the details to his friend, or in other words performs a language response of third intention, since it follows the implicit activity of recalling the act of burning himself.

3. Possibly the most potent influence for identifying language and thought arises from the fact that thought is made identical with implicit action and especially because there obviously exists implicit language.[1] Now certainly some of our thought behavior may be considered to be merely implicit action, and patently language reactions are as much subject to implicit performance as any other sort of reaction, but these facts themselves contain arguments for not identifying thought and language. For observe that only a part of our thought behavior is merely implicit action, and furthermore, we have no more right to make implicit language synonomous with thought than any of the numerous other types of implicit action all of which may just as well as language be considered as thought. Moreover, as we shall presently see, implicit language cannot be considered as genuine language activity, and so while we might think of such reactions as thought we cannot think of them as language.

Now although implicit language must be considered to be non-problem-solving thought we cannot take such a fact to be indicative of the identity of language and thinking, since implicit language would be very little if at all serviceable for problem solving or any other active thinking process. In fact, it is possibly only in dreaming (day or night) that we perform implicit language activity to any extent and we need hardly comment on the striking contrast between such passive activity and the more active process of thinking. In all other cases than dreaming we can accomplish many things

[1] Is it not this shifting from thinking as problem-solving, to thinking as implicit action which lies at the basis of Watson's identification of thought and language? *Cf. Brit. J. of Psychol.*, 1920, **2**, 89, et passim.

and more useful ones through the means of implicit non-language reactions (implicit construction, purchasing, etc.).

Granting that language functions most typically and most serviceably as psychological behavior when it is most overt, while thought as implicit behavior can be most serviceable to the person and operate most typically when there is a minimum of overt activity,[1] then we may find in this fact a further basis for disbelief in the identity of thought and language. We are convinced that language most useful for thinking must be overt activity, an instrument for contact with things, the actual handling of materials and not the pale reflection of conversation. It is really because of the overt character of language on the one hand, and the implicit character of thinking on the other, and not because they are identical, that overt language and implicit responses are so frequently operating in combination—so frequently, in fact, that it is even thought that they cannot operate separately. They cannot operate separately, it is said, in the sense that we cannot think without language, a statement, by the way, which may well be true in practice, but which carries with it no implication of inflexible necessity.[2] But at any rate, if it is true that language is more typical when overt, and much more useful for thought when so operating, then it is almost obvious that we cannot identify the two.

[1] Here we must distinguish between implicit action of any sort considered as thought, and implicit thinking. The latter, of course, because of the absence of any adequate stimuli, is about as ineffective a form of action as we can well imagine. Brooding and dreaming are examples in point. No one of course will confuse such implicit thinking with thought that goes on in terms of implicit action, say implicit military operation, even though the latter can be contrasted with thinking in overt terms, as in the setting up of a complex original scientific apparatus.

[2] Otis, Arthur S., 'Do We Think in Words,' PSYCHOL. REV., 1920, 27, 339–449, has excellently described a number of situations in which thinking is doubtless a distinct process from verbal language. While this author may not have successfully combated Watson's view which he attacks, because the latter does not limit his linguistic thought actions to verbal responses, we still believe that thinking, whether problem-solving or merely implicit action is not the same kind of psychological phenomenon as language. Perhaps it will not be considered too presumptuous of us to believe that, in view of our total rejection of any but an organismic hypothesis of thinking activity, Watson may not disagree with our practical functional distinction between thinking and language.

Provided that it is granted us that implicit behavior constitutes direct action to stimuli, may we not say that a clear distinction between thought and language is established? And yet we must not be too sanguine of the validity of our argument. Those who still hold that thinking is implicit action may say, "But by implicit action in the discussion of language we mean sub-vocal behavior." Now sub-vocal behavior from the standpoint of our present objective position is of course indirect. Consequently, can it not be argued that thought as implicit or sub-vocal language behavior is therefore indirect and can be justifiably identified with language? We will immediately reply: Even accepting sub-vocal language responses as true language behavior, their functions in common with language in general, are usually quite different from thinking as we have already seen, and further, they need not in fact always be true functional language responses. Certainly when they are merely sub-vocally uttered words they seem to be purely conventional symbols. On the other hand, if one insists that sub-vocal actions are not considered true language but merely taken to be implicit action, then, as we have already argued, we have no more right to identify such implicit language responses with thought than we have to identify any of the other very numerous types of implicit action with thought. As a matter of fact, from our standpoint sub-vocal language reactions are not normally implicit actions but overt responses of expressive form.[1] In order to clear up this problem of what actually constitutes implicit behavior we might turn at this point to the consideration of such reactions. Preferably let us compare implicit action with actual language responses.

Implicit reactions comprise incipient or other forms of actually direct responses to objects which result in no immediate change of condition or existence in the stimulus object. Let us notice that the most typical forms of implicit reactions are partial or vestigial remnants of originally larger or complete reactions as is excellently exemplified in the partially implicit visual-perceptual reaction which may be considered

[1] See below the distinction between expressive and communicative language.

as the seeing part or phase, or remainder of the original seeing-touching or other whole [1] reaction system. The distinction, then, between an implicit and explicit reaction is a functional one. In other words, an implicit act may be morphologically exactly like an overt act, but owing to the absence of the original stimulus object no effect is produced upon that object. Now it happens that because of the absence of the original object, or because first contacts with objects produce disruptive and inhibitory conditions, the later contacts with the same objects consist of modified reaction systems. These partial or totally implicit reaction systems take on their specific character of implicitness because of the person's mode of contact with the stimulus in question and not in any sense because of their non-visibility or lack of openness to the inspection of the acting person or someone else.

In this fact of the interpendence of response and stimulus, which of course is an inherently psychological phenomenon, we find the differentiating conditions which not only mark off overt from implicit behavior but also supply us with criteria for distinguishing one kind of implicit behavior from another. Thus when the original stimulus object is present in its customary setting we react to it in the same overt way as usual unless some interfering condition arises. When the original object is partially present, as when we can see but not touch it, then we perform a partially implicit response. When the object is entirely absent and we are made to respond to it through a substitution stimulus we have or may have an implicit action which is totally different from the original act though definitely derived from it. In case the same stimulus object substitutes for itself, which is a common occurrence as when a person makes us think of an experience we had with him some time ago, the resulting form of implicit action can be clearly made out to be a result of responding to the person in a previous setting through stimulation of the person in a present setting. In

[1] Different, we should perhaps say here, instead of whole, because every unit of reaction is a reaction system.

similar fashion, if we keep in mind the relation of stimulus and response we can differentiate between feeling reactions and other types of both implicit and overt behavior. While the stimulus object is present in the case of feeling responses the reaction systems consist of the mild or vigorous agitation of the person himself without directly producing any change in the stimulus object or in the person's relation to that object. Of course we have implicit feeling reactions and here the response is a vestigial remnant of the original reaction system induced by a substitution stimulus.

Implicit action, we may say, then, seems indirect because the original stimulus object is not present, or is not present in the same setting; but in either case, as we have previously made clear, the response has a direct adaptive bearing upon the adjustment stimulus. Our assumption is that implicit behavior constitutes direct adaptive responses in much the same way as the more striking cases of inhibition responses compose direct adaptive behavior. Contrariwise, in the case of typical language the action is overt and results or may result in some change in condition or existence of the stimulus, but the reaction is indirect because it is referential. Illustrative of such a situation is the operation of instrumental language responses.

Once more we may return to the distinguishing criterion between thought as implicit action, and language, bringing to bear upon the problem the facts concerning the relationship of stimulus and response. We suggest that while implicit responses are mediate and secondary reactions, that is to say, involve two forms of stimulation as do indirect language reactions, the contacts of the person with those stimuli in the two cases are so different that we must consider the respective actions to belong to different types of behavior. Differences in action and name between direct and indirect responses are due to the difference in character of the additional stimuli. Now what is the exact difference between the two kinds of additional stimuli? Our assumption is that implicit behavior is always a direct adaptation in spite of the fact that for its performance is required a

substitute or additional stimulus. We call the additional stimulus substitutive because its only function is to call out the reaction to the adjustment stimulus, while the response is always made to the adjustment stimulus. Quite different is the auxiliary stimulus in language reactions which must operate along with and in synchronous addition to the adjustment stimulus. It is a genuine auxiliary stimulus operating as an integral factor in the total language activity. Furthermore we might even suggest that because in the case of implicit reactions the second stimulus merely substitutes for the adjustment stimulus, namely the thing or situation reacted to, there is really but one stimulus, while in the case of indirect or language reactions there are always two stimuli for any specific reaction system. We have no hesitation, then, in asserting that language is not identical with thought, either when thought is considered as planning or problem-solving or when thought is made into merely implicit behavior.

Further evidence and of another sort, to establish the non-identity of language and implicit action or thought may be deduced from the following consideration, to wit, that the two types of action as responses to the same set of stimuli may definitely parallel each other without any sort of interference or conflict. Moreover is it not true that we can *think* of something beyond and entirely different from the thing or circumstance of which we are speaking, a condition which would be impossible if the two types of action were identical, since the person may be employing all of his language or thinking structures and mechanisms for performing one of the two simultaneously occurring forms of response?

Still another fact militates against our identification of language and thought (as implicit action). It is this, that our language reactions as far as their actual mode of operation is concerned are definitely acquired through social stimulation, whereas our implicit actions, though they may be symbolized, are to a great extent merely functions of our individual contacts with our surroundings. This individuality of response, it may be argued, is not any more true of thought

than it is of language, for thought is also socially conditioned, but here the question arises whether we are not shifting our discussion from mere implicit action to the more complex forms of activity, namely, planning, or problem solving.

Neither thinking nor implicit action, then, is identical with language activity, and further, even if we agree that language is not inseparable from thought must we still say that language is the sole medium for the expression of thought or the actualization of implicit action?[1] Unhesitatingly we answer 'no,' and especially if by asking the question it is meant in any sense to establish any peculiar relationship between thought or implicit action and language responses. That thought need not be exclusively actualized through language is evident from the fact that because thinking is planning or problem-solving the expression of the reaction would doubtless occur in the form of actual overt responses made by way of changing some object or circumstance. Similarly, implicit action, being non-effective immediate action, would most likely have for its expression the actual initiation of some behavior affecting the previously absent and substituted for object which now has become available. Of a certainty, conditions are different in situations in which no final overt action is contemplated or possible, and in these situations the actualization of the thought or implicit action will be achieved through the medium of language. Possibly it may be objected that what we have referred to as actualization of thought is not what is usually meant by expression of thought, but what is meant by expression is rather communication or telling someone of what was thought. Certainly the communication of thought, although a very frequent form of human action, does not occur with such constancy considering the total number of possible cases of thought action as to make any thoroughgoing concomitancy possible. Very much of the thought of the world is set down in writing or expressed by word of mouth, but not

[1] 'Expression of thought' is a faulty term, implying as it does the embodiment of a psychic stuff or process. When properly used it refers to the employment of language or other action during the act of thinking or informing someone of what thinking action we have been engaged in.

all of it by far, nor perhaps half of it. As a matter of fact language being the typical form of indirect or referential behavior we can readily employ it in referring to our thought reactions as well as to all other sorts of actions and things. When communication occurs we must admit that we cannot conceive of any behavior that is in any sense nearly so effective for the purpose as is language.

Before concluding our discussion we might ask why should psychologists attempt to establish an identity or inseparable relation between thought and language? We believe the answer to lie in the suggestion that such an attempt is made in order to make thought a definite mode of psychological reaction and not an indefinite form of mental stuff or process. Admirable as is the motive for this identification and much as we approve of the attempt to bring psychological facts out of the clouds of unverifiable assertion, we must still withhold our assent from such an identifying procedure in the interests of other facts. What are the other facts? Briefly, all those complex and interesting developments and operation of the exceedingly effective indirect forms of psychological adaptation which we call language.

V. Modes of Language Reactions.—Because of the multiplicity of occasions for language adjustments and the consequent differences in their variety it is essential to provide some descriptive definiteness and order for such reactions. Two tasks especially here confront us. The first is to mark off what are actual language reactions from behavior which may closely resemble language and yet not be language. And secondly, we must distinguish between totally different modes of definitely established language reactions, for in failing to do this we might exclude from our enumeration of the facts of language authentic language reactions, as would be the case for example were we to confine language to merely verbal speech.

1. *Morphological and Functional Language.*—And first we must point out that upon a functional basis only can we accomplish our first classifactory purposes, namely to separate off language from non-language behavior. Even where we

find behavior which is morphologically similar to other kinds of unmistakable language activities we must withhold from it the appellation of language unless it serves a language function. To put it differently, it must serve as indirect reactions or adjustments. Suppose I wish to have my typewriter operate more smoothly but cannot make the necessary changes myself; I must let my wishes be known to someone who is able to do it. My psychological adaptation is made by means of verbal speech or by pointing.

In contrast to this definite functional operation of language behavior it may happen that I may utter perfectly formed words or perform other genuinely linguistic reactions which will not at all serve as instrumental or even indirect adjustmental acts. These then we will exclude from the domain of functional language. An example would be the words we utter as replacement reactions in emotional situations. Along with the large number of reflexes which replace the absent final reaction system in emotional behavior segments we may utter words, mere verbalizations that are really acquired reflexes, which, owing to the fundamentally non-adjustmental character of emotional reactions, no more adapt the person to his surroundings than do the reflexes.[1]

Again, the use of words by infants in imitation of bits of conversation overheard also illustrates what is perfect language morphologically, but what at the same time is not in the least language functionally. It is possible also that words and phrases used by dissociated and otherwise abnormal persons (verbigeration) may exemplify morphological similarities to language responses but are certainly not themselves such behavior.

When we turn to other than verbal language reactions the criteria between language and other forms of behavior cannot be so well made out, since there is not the sharp division there between morphology and function that there is in the case of vocal language reactions. But since we assume the criterion of language to be the question whether the person performs an indirect response we can at least

[1] *Cf.* Kantor, 'A Naturalistic Description of Emotions,' PSYCHOL. REV., 1921, 28, 19–42, 120–140.

specify what are not language responses. For example, we can distinguish the true language reactions of the infant from its random acts that may be only morphologically language, if language at all. Thus the crying act of an infant may be considered both as a definite indirect action serving to communicate to someone its uncomfortable situation or as expressive of some such discomforting condition, but on the other hand the crying may be, from the language standpoint, purely random actions along with many other sorts of infant behavior which are merely indicative of superabundant energy.

And here an important suggestion surges in upon our exposition. In the form of a question it is this: what can we say of implicit language behavior, since by becoming implicit such behavior loses its function of indirect overt adjustment? To this query we can only answer that we must accept the dictates of hard facts and agree that implicit language is not language, precisely as we say that spending money implicitly or partaking of a meal implicitly is not spending or eating. In our opinion we cannot avoid this conclusion much as we may consent to the proposition that implicit language reactions are morphologically just like definitely overt language responses.

To balance, as it were, this exclusion from the domain of language of a whole class of psychological reactions we must propose the unqualified inclusion of interjectional reactions in the realm of language. Especially is this inclusion to be urged in view of the fact that philologists either exclude or attempt to exclude interjections from language phenomena or else they tend to minimize the importance of such behavior. Why they do this is plain, since interjections are not conventionalized as are other forms of language. From the standpoint of reactions, however, such behavior answers as definitely and as effectively to the criteria of language behavior as any other sort of language reactions. To be more succinct, interjectional language reactions function as means or instruments to express the conditions of the person induced in him by various surrounding persons and events.

2. *Expressive and Communicative Language.*—Within the field of functional language, that is to say, definite language reactions, we may introduce a distinction of great importance; we may divide language into two large divisions, to each of which we may apply a distinctive term or name, to wit, expressive and communicative language.

(*a*) *Expressive.*—In general, we might characterize expressive language behavior by indicating that it comprises the individual's adjustment to stimuli which do not necessarily involve any relationship to another person. Expressive language reactions we may look upon, therefore, as in a sense the most illustrative of our indirect responses, since the exclusion of persons removes the possibility of a connection between language and any direct adjustment. But observe that when the reaction results in leaving a record, such a record may become a stimulus for some direct action on the part of the person and in consequence the original action may be considered as connected with a direct action. To illustrate, as I react favorably to a painting in an exhibition I express my admiration by writing 'wonderful' opposite the catalogue number of the painting. This expression may become a stimulus for my friend to purchase the picture.

Is it not easy to see that expressive language better illustrates indirectness of response because of the passivity of the reacting individual? Expressive language activity is more of the nature of self-recording behavior, the registration of how some object, event or person has affected us or how we should like or hope to have an event turn out, etc. Contrariwise, the communicative language reaction may take place through any number of intermediate persons as is illustrated by the passage of an order down through an ecclesiastical or military hierarchy. Certainly we can no better put the matter in hand than to say that expressive language actions stand as responses only; they do not serve as stimuli for other persons as is the case with at least some of the communicative language reactions.

Indirect, expressive language certainly is, but still it may involve the elaborate employment of tools or instruments

(pen, picture) for its production, but here the instruments would be employed entirely to further the process of expression and not to effect some change in the adjustment stimulus object or to communicate in others the desire for such a change.

In all of this discussion let the reader beware, we are not using the term expression in the sense of a verbal or gestural manifestation of a mental state. Such a warning is doubtless superfluous from the standpoint of our exposition but the mentalistic way of looking at the matter is so prevalent that we cannot too frequently assert our departure from that tradition.

In quite another sense must we guard against a misconstruction concerning expressive language, namely, the idea that it expresses or is especially connected with emotions. In some sense this view is intimately associated with the general idea that language is the expression of mental states, for here it is assumed that an emotion is the mental state expressed. Now the patent reply to such a view is to assert that by means of expressive language the person performs actions involving what we may call ideas, desires, hopes as well as performing reactions that adjust him indirectly to events past, present or future. From the standpoint of the actual adjustmental situation expressive language is in no sense different from communicative language and in this statement we disagree with those who would make expressive language emotional as compared with communicative language which is assumed to be mainly or exclusively the expression of ideas.

Turning to the morphological feature of expressive language reactions we might expect, because of the commonness of verbal behavior, that expressive language will consist to a great extent of verbal reactions. But as a matter of fact, in comparison with communicative language, typical expressive reactions consist to a considerable degree of gestures of various sorts, facial expressions, smirking, sneering, crying, smiling, laughing, etc.

(*b*) *Communicative.*—In contrast to expressive reactions communicative language involves adjustment to some other person or persons and consists to a considerable degree of intentional and substitutive responses designed to bring about some change of an informational or overtly active sort in that other person with respect to the adjustment stimulus object or condition. We might indicate at this point that the criterion of communication depends upon the behavior of the second person rather than any result achieved by the first or stimulating person. In plainer words, we have communicative language when the transmissive or the first person's language reaction actually serves as a stimulus to arouse a response language reaction in the recipient. It follows, then at this particular point that the different phases of communicative language must be determined exclusively with reference to directly observable activities actually accomplished; that is to say, we need not consult the intentions or refer to the purposes of either person in the communicative situation. It is not a question whether they intended their language response to be heard or otherwise responded to. But we do not mean to exclude from our observations the distinction in communicative reactions between language spontaneously addressed to another person and language induced in the addressing person by a question or command of another individual. In the former case we consider the indirect reaction to be initiated by the adjustment stimulus (the thing spoken of) which reaction is then also conditioned by the auxiliary stimulus, namely the addressed person. The latter case, on the contrary, exhibits a reaction started off by the auxiliary stimulus (the person giving the command) which later, comparatively speaking, connects up with the adjustment stimulus (the object reacted to in the carrying out of the command). It must be observed, however, that the purpose of the first person is not essential as a characterizing feature of instrumental communicative language, for it may well be that my conversational reactions in which I relate to my friend the incidents of my trip abroad will serve as an instrumental stimulus for him to take the trip.

Purposes and intentions of individuals with respect to the adjustment stimulus do however make possible within the domain of communicative language the distinction between conversation and instrumental speech. Conversational language is communicative speech in which the transmissive individual is not planning any definite direct action with respect to the adjustment stimulus, while in instrumental communicative speech such a purpose and intention is manifest. That the purpose or intention refers to the changes with respect to the adjustment stimulus and not to the actions of the speaker is hardly necessary to make a point of.

In suggesting examples of communicative language we might mention verbal speech, and possibly song and music, as well as gestures (pointing), printing, writing, telegraphy, signaling, of various sorts, etc.

Poetry and other forms of literary production when considered as language reactions partake of both the expressive and communicative forms of language. As references to the esthetic adaptations of persons they are of course expressive reactions, but on the other hand they do serve to arouse reactions in other people in the sense that the language responses (poems, for instance) of the first person are at the same time communicative as well as expressive. These reactions as reactions may intentionally or unintentionally, but not accidentally, on the part of the reacting person inform the stimulated person of some fact or condition by means of some symbolic or instrumental, or at any rate, some indirect action.

Receptive and Transmissive Communicative Reactions.— Very essential it is to distinguish within the field of communicative language behavior between the receptive and transmissive sorts of reactions, a distinction made imperative by the fact that communicative language is interactional, that is, it involves two persons. It may well be in many cases that we are speaking of exactly the same act or the same sort of action, but in the one case the actor communicates with some one, whereas in the other, someone is being

communicated with. Or we might say that in transmissive action the person's acts serve as stimuli to induce meaning reactions in a second person whose receptive action is at the same time a stimulus to the first person to perform a meaning action which again serves as a stimulus for the second, etc. In general, communicative language typifies the closest and most intensive interstimulation and interresponse activity.

Among the (1) transmissive responses we may name for illustrative purposes, speaking, writing, making signs, gestures, etc., while among the (2) receptive language reactions we may include hearing and seeing responses of all sorts.

As a final remark here it may be well to suggest that communicative language behavior is neither necessarily always more complex nor higher in the scale of human performances than the expressive language reactions. Quite the opposite, in fact, since some expressive language reactions such as poetry are by far as important as any kind of communicative behavior and certainly much more complex than most speech reactions. That this point is almost obvious is seen from the fact that much of the expressive action may be communicative as well as expressive.

In summing up the psychological facts which fall definitely under the heading of language behavior we find a large series of reaction types beginning with shoulder shrugging and other forms of gesturing which grow by combination and integration out of non-language expressive and manipulative actions and run up to the most complex and elaborate forms of verbal speech behavior.

VI. Types of Language Reaction Systems.—Not only can we differentiate between the various stimulus-response language situations as we did under the heading of modes, but we may also provide some arrangement of the vast amount of linguistic materials by classifying them according to the specific reaction systems involved. Naturally enough because of the similarities and overlappings in these reaction systems no hard and fast lines can be drawn between the different forms of language responses, still some order is

possible. Accordingly, we plan to arrange a series of classes of language-reaction systems, a series founded on the differences between communicative language and which cuts across the boundaries between communicative and expressive speech. We base our classification on the communicative type of speech on the ground that not only will a greater simplicity and definiteness be achieved, but also, because no form of language activity need be neglected since under communicative language is represented every form of language act. Our greatest line of differentiation then will be that between the transmissive and receptive modes of action.

I. Primarily Transmissive Modes of Language. (*a*) *Vocal Speech.*[1]—Very prominent in the list of all language reactions we find of course vocal speech. Not only has this type of language been developed as the most prominent form of expressive and communicative adaptation, but such language reactions have become connected with and instrumental to some of the most complex behavior of which the human being is capable. Vocal speech is an integral factor in all of our voluntary and thinking action, as well as our general social conduct. Under this heading we may place all the behavior phenomena which can be subsumed under the rubric of speech or talking.

In considering the graphic forms of sign and symbol making, that is to say writing and printing, we observe that a special virtue attaches to the fact that these reactions require an extension of the person's organic equipment for their performance. Not only can we thereby extend the scope of our immediate behavior as illustrated by the difference in transmitting information and other materials by word of mouth or gestures, but we also obtain thereby a more permanent record. It is not without the range of possibility that as Professor Warren[2] suggests, "the chief rôle of graphic language is to extend the range of communication

[1] It is not intended that this list should be arranged in the order of the importance of the reactions involved, since even in the absence of an objective standard it must be conceded that written language in cultured groups hardly stands second in functional value to vocal speech.

[2] 'Human Psychology,' p. 319.

in space and time." Think only of the information concerning ancient civilizations which the people of those times have supplied for us through the instrumentality of signs on bricks, clay tablets, monuments, etc.

(*b*) *Vocal Gesture.*—The vocal apparatus of the human individual not only is the instrument for our fully developed speech reactions but also for the simpler vocal gesturing, such as calling, crying, whistling, sighing, grunting in infants, singing and other forms. Vocal gesturing, while ordinarily expressive language behavior, can also function as definitely communicative expressive language reactions.

(*c*) *Sub-vocal Speech.*—Besides the overt and complete language behavior we have many kinds which are not audibly performed. Among such reactions are the silent speech and silent reading responses and more typically perhaps those language activities serving as phases of what are known as "mental" arithmetic, etc. By far the most of our complex behavior such as planning, brooding and various forms of thinking include many various forms of sub-vocal language. The student of language may well question whether these reactions may be considered as primarily transmissive, since we can very readily think of numerous instances in which they serve receptive functions, but in view of the fact that self-communication, in which they are transmissively employed, is so common, we include them here.

(*d*) *Non-Vocal Gesturing.*—Much of our language behavior goes on in the form of gestures; in fact since under this rubric we include most of the language reactions not involving vocal or verbal behavior the field of gestures is very large. Such behavior comprises a great variety of forms; here we have deaf and dumb language, the shoulder shrugging, facial gesturing and the movements of various parts of the body, eyes, arms, hands, head, etc.

Gestures are not only primary and exclusive language adaptations to various stimuli but they also function as adjunct responses along with other language reactions. Thus the motions of fingers, hands and arms, the shrugging of the shoulders and numerous sorts of facial expression may

constitute the more or less essential accompaniments of vocal speech. So important are such accompanying reactions in many cases that without them the vocal reactions carry little or no significance. A field experiment in this connection involves the observation of the degree of understanding which we derive from listening to conversation both when it is and when it is not accompanied by gestural responses.

Possibly it is not beside the point to assert that gestural language represents almost every phase of human adjustment to stimuli. It may express and communicate thought, feeling, desire, the state of health, kind of disease, activity, and other forms of adjustment. By language gestures we perform almost every sort of adaptation that we can otherwise execute.

(*e*) *Making Signs and Symbols.*—Very numerous are those language reactions requiring some extension of the organism's natural equipment for their execution. While vocal and bodily gesturing involve merely our own elaborate organismic equipment other forms of language behavior involve the use of instruments such as a pencil, pen, graver, pennants, type and paper, skins, stones, and other impressible materials as well as sound-making (telegraph) and other types of mediating tools. Such instruments are employed not only for our own personal activities but also for our complex social responses since the most important technical and scientific information can be intentionally conveyed by the use of such instrumental reactions. Most interesting is it to observe that the language reactions in which we employ tools for sign-making are not in principle different from our complex verbal reactions. The latter also involve definite autonomous tools or instruments, that is to say, sound combinations or symbols. Are not the entire set of materials with which the philologist deals formal symbolic tools employed by specific groups of individuals as media of intercourse, tools which are modified and developed to suit their own specific needs? In comparing sign and symbol language with verbal responses we find the greatest difference to lie merely in the fact that the latter are performed exclusively with our own organismic

equipment. Examples of this sign-symbol class of language responses are writing, printing, picture drawing as in the case of the cave dweller, using codes of all varieties, stamps and flowers, also wigwagging and signaling of all sorts.

While expressive language is not excluded from this type as witness the inclusion of picture and other forms of writing, these reactions on the whole serve to convey in a more formal manner than expressive behavior our ideas, wants, desires, etc.

II. Primarily Receptive Reactions.—While as a matter of fact the receptive language reactions consist mainly of definite seeing and hearing responses we might generalize all of the characteristically receptive reactions and group them under the heading of understanding. In so doing we not only generalize all the specific reactions but we separate off the understanding reactions which are precurrent to or anticipatory of final language reactions from the latter. This separation is made possible primarily by the fact that in the majority of cases the seeing or hearing acts are precurrent understanding reactions which may accompany other precurrent acts of an implicit or partially implicit nature, while the end reactions in a language behavior segment are overt reactions. We might point out also that the justification for separating the understanding reactions from the rest of the behavior segment lies in the possibility it affords us of a better comprehension of the whole series of factors.

Understanding responses are meaning reactions. That is to say, they function as means to the performance of some other act, and may be roughly said to consist of a realization or discrimination of the stimulus object or condition. This realization makes for an appropriate final response. The degree of realization ascribable to the meaning response depends upon whether the precurrent reactions in a behavior segment are or are not exclusively overt. As a matter of fact, the simplest sort of understanding reaction is one of which there is no discernible precurrent reaction at all but only the one overt reaction system. Such a case is illustrated by the incident in which pulling the hand away is practically

a part of the hearing of the admonition to "look out for the saw." Or we might say that a simple reaction system includes the linguistic hearing act plus the reply, with whatever language that contains. If the stimulus calls out definite precurrent acts, but only overt ones, as is the case when we first exclaim, "Oh, a saw," and then pull our hand away, we must assume that there is a greater degree of understanding or comprehension of the situation involved. Even more understanding or comprehension of the stimulating situation must be ascribed to the precurrent receptive language reactions when they accompany or precede thinking actions. In these cases we have very complex behavior segments or behavior patterns which are combination thinking and language reactions. We wonder whether it is not owing to the strikingness of these complex combination responses that the mistake can be made of identifying language and thought. The reader must observe that in all of our illustrations we have assumed that the language reactions are indirectly adapting responses connected with direct overt and implicit responses. Such are the typical ways in which our language reactions operate, for they are in the final analysis always definite adaptational reactions and are thus conditioned by the stimulating auspices. Further, it must be observed that although in our illustrations we dealt with language understanding responses serving as precurrent functions such reactions may themselves be final responses.

(*a*) *Reading and Comprehension*[1] *Reactions.*—To turn now to the more specific receptive language reactions we find here a series of specific types of understanding responses to a variety of different stimulating situations requiring different modes of contact such as visual, auditory or other sort. Reading, for example, covers a series of responses to language stimuli seen, while comprehension composes a number of responses to sounds heard, as in listening to verbal speech or other sound stimuli. The reaction systems operating here

[1] In the absence of a word to represent understanding responses for auditory stimuli corresponding to reading for visual stimuli the writer follows Professor Warren in using the term comprehension in a slightly technical sense. *Cf.* Warren, 'Human Psychology,' p. 320.

involve especially the visual and auditory receptor mechanisms, the optic and auditory neural pathways, localizable cortical mechanisms, all sorts of muscular mechanisms (eye, head, chest, laryngeal) and various speech processes. These different specific comprehension and seeing responses, it is well to observe, may involve different orders of action on the part of the responding individual. The stimuli of the comprehension and language reactions may be (1) intimate internal mechanisms in the sense of actual speech, or (2) partially external mechanisms as in the employnemt of signs or (3) mainly non-organismic mechanisms as in writing to a person or printing material for him.

The term reading, let us note, covers not only the ordinary acts of perusing print but all forms of visual reactions to linguistic stimuli. Thus, we may speak of reading facial expressions and gestures of all sorts besides lip reading in its various forms. In all these cases reading constitutes adjustment responses, while in other situations as in vocal speech conversation the reading of expression and gestures constitutes auxiliary reactions either as (1) additional responses to the speech stimuli or (2) as direct reactions to gestural expressions serving as the setting factors of the vocal speech stimuli.

What is meant by hearing is more definite and familiar and requires no further comment with the exception that we might suggest that just as in auditory reactions we find auxiliary visual components so in visual language reactions we may find auditory components, for example, implicit reactions to sound stimuli. As our last sentence indicates, we may think of reading as a general name for visual receptive language reactions, while the term comprehension serves in a similar capacity for all receptive auditory responses.

(*b*) *Tactual Receptive Language Reactions.*—Reading and writing constitute what we may well call the normal and usual forms of receptive language reactions. Besides these types we find also, though in unusual cases only, that tactual reactions are also made to the transmissive reactions or language stimuli. Examples are the reactions of the deaf and blind to the lip movements of other persons and to the raised types of blind printing.

VII. The Varied Character of Language Phenomena.—From our study of language phenomena we may readily derive the notion concerning the multiple character of such facts. Not only is a language response a definite adaptation to stimuli but it may at the same time itself be a stimulus for another response. Moreover, as we have already intimated, it is necessary to separate the psychological facts of language from the physical, social and other phases of language and incidentally bring into sharper relief the functional and dynamic character of language. Probably we can best accomplish this our present purpose by analyzing a word.

1. *Non-Psychological Language Words.*—(*a*) In the first place, a word may be considered merely as a purely physical or natural object which exists in nature exactly like any other physical thing and with the same characteristics. Here we mean to refer to a printed word (as it stands unread in a book) for example, or to a sound. Now of course in contrast with a physical object such as a stone we might say that the word as a physical object was invented or developed through some human agency, but this difference between a stone and a word is only relative, for surely all of the stones in our urban environment, at least, have been somehow transformed or modified through human agency, but this in no degree minimizes their physical or objective character.

(*b*) A word may be considered also as a human institution and now we refer to the word as a member of a specific series of language customs. Here the word has a very different potential function but still it may exist totally unused and little known. Such instances are all of the words in the Moeso-Gothic language which exists only in the Bible version made by Bishop Ulfilas.

(*c*) Another type of word which belongs to the class of the two previous words, namely non-psychological data, is the uttered word under certain circumstances. Now we are thinking of the word act, the act of speaking a word, which is merely morphologically language but not functionally so. Here we have random vocal actions which do not function either as an expressive or communicative adaptation. For

instance, such a word as that uttered by a person when under the effect of ether. While these are undoubtedly psychological acts instead of natural or physical objects they are not data for the psychologist of language nor do they belong to the domain of psychological language behavior.

2. *Words as Definite Psychological Data.*—All three of the words we have just discussed may be considered as things and acts, but not as serving any specific language function; they are independent of any immediate language use. We will next consider the words serving in some sort of language adjustment. Now let it be understood that in this case we may still be referring to these other words but now they are, psychologically speaking, in some functional relationship. From a psychological standpoint it is only in case words are in a stimulus-response relationship that we think of them as definite psychological data. We may differentiate then between the following forms of stimuli and response words as psychological language data.

(*a*) *Words as Stimuli.*—Here we may speak of a printed word which serves as a definite stimulus to arouse a language response in some person, any kind of physical word which calls out an indirect reaction. This word we may look upon as a symbol, which presumably with or without the intention of anyone at this moment calls out a meaning or language response in some person.

Also under this division we have word acts serving as stimuli language functions. Here we include definite verbal utterances which bring about responses on the part of some person whether the individual himself or some other person. We may consider these word-acts as stimuli, irrespective of whether the person intends them to be such, and so we might indicate here that we have two classes of definite language function, named, respectively, expressive and transmissive stimulus word-acts. We may also observe that these words may operate as definite symbols in the same sense as the printed word. Probably in most cases in which the non-transmissive stimulus word-act operates, the total segment of behavior will not be language. That is to say,

the word voluntarily performed by the person may still not serve to elicit a definite language response on the part of some other individual.

(*b*) *Words as Responses.*—Here we think of the phases of the word in its functional operation as a response to some sort of stimulus, whether language or not. Now these words may be definite overt responses as in the case of answering questions, or they may be sub-vocal or other forms of verbal meaning and understanding responses. They may operate as final acts or as precurrent responses to some other final response.

In summarizing this analysis of words as language data and the differentiation of them from various kinds of non-psychological data, notice that we may speak of what from the every-day standpoint is considered the same word, but this same word is both physical and psychological, and may be at the same time both a stimulus and a response.

VIII. Summary.—(1) For objective psychology the problem of language is to place the prominent and pervasive linguistic reactions in their proper perspective with relation to the other coördinating functioning responses to stimuli and to avoid looking upon language as outer manifestations of mental states or the mere mechanics of speech.

(2) As a preliminary approach to the analysis of language we have distinguished between anthropological data (language as cultural products or entities; the philological data (language as fixed conventional modes of phonetic systems and their symbolic representation) and the psychological data (language as adjustmental behavior, that is, definite responses to stimuli). To a considerable extent the materials of the anthropologist and the philologist may be looked upon purely as stimuli when they are phases of psychological situations.

(3) A language act, being as definite a response as any other psychological act, must be somehow differentiated from other kinds of action. Our criterion is that language responses are inherently indirect or referential adaptations to stimuli, that is, they involve two stimuli, one the adjustment

stimulus, or the thing, person or situation acted upon or reacted to (for example a book to be picked up), the other an auxiliary stimulus or the person using language (giving a command, for example, for the book to be picked up). Two kinds of indirect action we may find, which we named respectively (1) mediative (language reactions connected with a direct reaction), and (2) referential (language reactions not connected with a direct response), the mediative type being related to direct action in three ways, namely, preceding, accompanying, or following, and the referential type either substituting for direct action or being purely conversational.

(4) Because of the close relationship and apparent similarity between thought and language (a similarity which leads psychologists to identify the two), we compared these two types of behavior, pointing out that they constitute (*a*) different types of adaptive responses on the part of the person and (*b*) that the two operate very differently.

(*a*) Thinking acts are either (1) planning, problem-solving, etc., definite adaptations to problematic or difficult situations or (2) simple implicit responses, that is to say, responses to absent adjustment stimuli aroused by a substitute stimulus. When thinking acts fall under (1) they are clearly different from conversation or language communication. So far as (2) is concerned, all types and modes of behavior may be implicitly performed including thinking (problem-solving), and consequently thought is no more identical with speech than with drinking or smoking.

With respect to (*b*), whereas language is always indirect adaptation, thinking is always direct.

Other facts militating against the identification of language and thought are (*a*) we can think and speak, or otherwise linguistically react, simultaneously to the same stimuli without any interference whatever. Also we can react to two entirely different stimuli at the same time when frequently it is possible to assume that either would require the use of the whole set of the same response factors that would have to be used in the other action, and (*b*) language

responses are different from thinking reactions (as implicit action at least) because they are more conventional.

To all of this discussion it should be added that from a morphological standpoint at different times thought and language may involve of course the same structural elements.

(5) Language reactions may be divided into various modes, (1) morphological (not serving true language function) and (2) functional (acting as a definite language response); the latter divided into (*a*) expressive (not involving any adjustive relationship to another person), and (*b*) communicative (involving adjustment to some other person). Communicative reactions are divided into (1) transmissive (language reactions serving as language stimuli) and (2) receptive (language reactions serving as responses only). Much of the expressive action may be communicative also, provided it serves as a language stimulus for some other person.

(6) Language reaction systems can be classified on the basis of a communicative form of language into the following types: I. Primarily transmissive, (*a*) vocal speech, (*b*) vocal gesture, (*c*) sub-vocal speech, (*d*) non-vocal gesture, (*e*) making signs and symbols; II. primarily receptive language reactions or understanding responses, (*a*) reading and comprehension, and (*b*) tactual receptive language reactions.

(7) Finally to differentiate between the various characters of language phenomena we analyzed words as follows: I. non-psychological words—(*a*) as purely physical or natural objects, (*b*) as morphologically language but not functionally so, (*c*) as human institutions (language custom); II. psychological data-words, (*a*) words as stimuli, and (*b*) words as responses.

A NEW APPROACH TO THE STUDY OF GENIUS[1]

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Three stages may be noted in the study of genius during the last century. The first of these is typified by the work of Moreau de Tours, Lombroso, and Grasset. Its methods were impressionistic and anecdotal. Its characteristic procedure was the search for striking cases which would lend support to a preconceived theory.

The second stage is represented by the researches of Galton, de Candolle, Odin, Ellis and Castle. Here the method is inductive, the selection of cases is based upon objective criteria, and the data are subjected to statistical treatment. Although the studies of this period marked a tremendous advance, they were limited by the nature of the biographical material upon which they were based. In the first place, the genius of biographical encyclopædias represents a selected type, namely, the socially successful. Extraneous factors doubtless operate to influence the personnel of such encyclopædias and the amount of space given to individual cases. In the second place, the biographical data are so incomplete and, what is worse, often so unreliable, that only an extremely limited number of facts can be assembled for as many as 75 per cent of any objectively selected group. Information regarding early life and training is likely to be especially scanty and untrustworthy.

A third and very significant advance is marked by Cattell's study of living American men of science. Here the selection of cases is accomplished by vastly improved methods, the desired data are obtainable from practically 100 per cent of his subjects, and the facts treated can be accepted as

[1] Paper presented before the American Psychological Association, Princeton meeting, December, 1921.

really facts. It is to be regretted, however, that it has not been possible in Cattell's study to secure the data which would be necessary to give a reliable picture of the juvenile traits and early mental development of his subjects. Those of us who have envied Professor Cattell his opportunity to witness the dramatic rise of his subjects from the mid-forenoon of their careers to their zenith, and their later subsidence or replacement by other luminaries, naturally regret that the author has not been able to extend his observations back to the period of childhood.

The logical next step is the study of genius in the making, that is, the investigation of gifted children. This approach has the great advantage that the number of obtainable facts is limited only by the time, patience and resources of the investigator. It opens the way to a more thoroughgoing study of the genetic aspects of the problem, of the environmental factors which affect genius, and of the exact nature of its deviation from the average. Tests and measurements in unlimited number can be made, and norms can readily be secured for the interpretation of data so collected. Moreover, follow-up work with large numbers of gifted children will throw light upon genius which aborts or deteriorates, as well as upon that which fulfills its promise. By this method we may even hope to learn something in time about the pedagogy of genius. We shall be able to test the theories of Witte, Berle, Wiener, Sidis, and others who believe that it is possible to make any child a prodigy. We shall find out to what extent, if at all, nature tends to even up the score of gifts by taking from him who has more than his fair share of one desirable quality some other advantage. We shall find out what truth there is in the widespread view that gifted children are usually conceited, freakish, socially eccentric, and prone either to illness and early death or to nervousness and insanity.

Perhaps a brief personal note in this historical sketch will be pardoned. My own interest in gifted children dates back to a master's thesis on leadership in 1903, to a review in 1904 of the literature on precocity, and to an experimental

study of bright and dull children for the doctorate in 1905. It is unnecessary to recount the scanty results of these juvenile studies. By the time it became possible for me to return to the problem, in 1910, the progress which has been made in mental testing had created a new situation. For certain ages, at least, it was now possible to determine with some degree of approximation the relative brightness of a given child as compared with unselected children of his age.

It was in 1911 that we began more or less systematically to collect data at Stanford on children who had made exceptionally good records in a mental test. In 1913 three schools in San Francisco were sifted for bright children, and the following year certain data were published on 35 cases testing above 120 I.Q. Ratings on several traits were secured and a brief information schedule was filled out by the teacher. The results of this explorative study were considerably out of line with my own expectations and in contradiction to earlier views which I had published on the dangers of precocity. In passing it may be noted that one of the bright children tested in 1911 is now a teaching assistant in Stanford University, that another was recently awarded a scholarship for meritorious record, and that a third had just received his Ph.D. degree and been awarded an $1,800 research fellowship by the National Research Council. Not one has yet become insane or developed symptoms of post-adolescent stupidity!

In 1916 the methods were considerably revised. The teacher's information schedule was enlarged, a similar information schedule was prepared for the parent to fill out, and ratings on twenty traits were secured both from parents and teachers. Data were collected on 59 cases testing for the most part above 140 I.Q. The results have been summarized elsewhere[1] and need not be reported here.

The establishment by the university of a special research fellowship in 1919 was the occasion for further revision of method and a stimulus to renewed search for cases. Unwisely, as it now appears, the number of traits to be rated

[1] 'The Intelligence of School Children,' Houghton Mifflin Co., 1919.

was increased from 20 to 46. However, the information schedules were materially improved and an interest blank was arranged for the child. By the spring of 1921 approximately 180 cases testing for the most part above 140 I.Q. had been located, and for 121 of these fairly complete supplementary data had been secured. Some of the outstanding results for this "first group" are as follows:

1. The number of very high cases is larger than the standard deviation of the I.Q. distribution for unselected children would lead one to expect. It is doubtful therefore whether the incidence of superior intelligence follows the normal probability curve.

2. The sex ratio for all the cases together is 60 to 40 in favor of boys. Above 160 I.Q. it is 65 to 35, and above 180 it is 70 to 30. These figures are not conclusive, however, owing to the fact that only a minority of the cases were discovered by a systematic canvass of the sexes.

3. As regards physical traits, it may be tentatively stated that these children, as a group, are above the average in height and weight, that they were precocious in learning to walk and talk, that they show no apparent excess of nervous symptoms, and that their general health conditions appear to be at least as good as the average for unselected children.

4. As regards school progress, the average acceleration is about two grades beyond the standard for their life ages; but as compared with the standard for their mental ages, there is an average retardation of more than two years. All but four have skipped one or more grades, and there are no genuine cases of grade repetition. According to the statements of their parents, about one sixth have been mildly encouraged to make rapid school progress, one sixth have been deliberately held back, and the remaining two thirds have been allowed to 'go their own pace.' Possibly three or four have been more or less systematically 'stuffed' but only one of these is near the top of the list.

5. Family data show strikingly superior heredity. On the Taussig five-fold classification of occupations about 50 per cent of the fathers belong to class 1 (the professional

group), as compared with 4 or 5 per cent of the general population, while 37 per cent belong to class 2 and 13 per cent to class 3. Neither class 4 nor class 5 (the semi-skilled and unskilled occupations) is represented at all (in this 'first group'), unless we rate a barber as belonging to class 4. Fifteen of the 121 cases belong to seven families. More than a third of the parents are known to have one or more relatives who have attained a considerable degree of prominence. About 20 per cent of the father's and mother's sibs belong to one or another of the learned professions.

6. The parents whose families are reckoned complete have an average of only 2.53 children. The average age of fathers at the birth of the gifted child was 36.2 years; that of the mothers, 31.4 years.

7. As regards racial differences, there are two outstanding facts: there is a noteworthy excess of Jewish cases and a still more striking deficiency among Italians, Portuguese, Mexicans and Spanish, all of whom are numerous in the vicinity of Stanford.

8. The trait ratings, owing to the usual halo effects, have yielded data of only limited value. The halo largely invalidates any comparison of our group with normal children on the traits in question, although it does permit a comparison of parents' and teachers' ratings with each other, also a comparison of average ratings on different types of traits. Classifying the traits under the five headings, intellectual, volitional, social, emotional, and psychophysical, we have the following average ratings by parents and teachers for the traits of each group, where the rating 1 is highest, 3 is average and 5 is lowest.

	Intellectual	Volitional	Social	Emotional	Psychophysical
Parents.....	1.67	1.98	2.13	2.18	2.28
Teachers.....	1.64	1.99	2.08	2.04	2.27

It is seen that both parents and teachers tend to rate these children high on all types of traits; but especially

high on those which are classed as intellectual and volitional. Teachers tend to rate rather consistently higher than parents, but the rank order of the traits based upon the ratings accorded by parents correlates .76 with a similar rank order based upon ratings by teachers.

9. The data on social adaptability and allied traits have been examined with special care, with the result that approximately two thirds of our cases have been classified as entirely normal or superior in this respect. A case study of the remaining one third shows that only three or four are seriously maladjusted. The difficulties of the large majority in social adjustment are readily accounted for by the natural tendency to jealousy and resentfulness on the part of their older classmates whom they almost invariably surpass, a form of reaction to which even teachers do not seem to be entirely immune.

The above conclusions are tentative only. The data on which they are based are faulty in more ways than we can here enumerate. What had been learned thus far, was, largely, what not to do; also, that what needed doing would be too costly for the little budget available. Fortunately at this time the directors of the Commonwealth Fund came to the rescue with a grant of $20,300. This subvention is being devoted to the search of 1,000 cases and to the immediate collection of psychological, educational, and social data concerning them. The expense of follow-up work will be borne for an indefinite period by Stanford University. Four full-time assistants began field work in September, 1921. The plan is to secure the following data from as many as possible of the 1,000 cases:

(1) At least two intelligence tests;

(2) Achievement tests in all the main school subjects; involving altogether three hours of testing;

(3) A general information test of about an hour's duration;

(4) A two-hour test of certain moral and emotional traits (for at least a part of the subjects);

(5) About 20 anthropometric measurements;

(6) A record of all the books read during two months, together with the child's rating of each book;

(7) A test of interest in and knowledge of 90 typical plays, games, and amusements permitting the computation of deviations from age and sex standards;

(8) Ratings from parents and teachers on 25 traits, by a much better method than we had formerly used;

(9) Data to be supplied by the parents in a 16-page Home Information blank, by the teachers in an 8-page School Information blank, and by the child himself in a 4-page Interest blank;

(10) Home and neighborhood ratings on the Whittier scale;

(11) Of a small number of the highest cases more intensive studies will be made, especially with reference to heredity.

All of the tests and information schedules will be used with 500 or more unselected children from 8 to 16 years of age, in order to secure the necessary background of comparative norms.

A report of salient findings will be made in 1923 but the detailed treatment of data may occupy several years and the follow-up work an additional decade or two. Naturally the value of the data will be greater twenty or thirty years hence than at present.

A word about the selection of cases. For many reasons it did not seem feasible to attempt to locate *the* 1,000 brightest children in the state. The effort is simply being made to locate that number having a Binet I.Q. above 140 (also, by methods we cannot here describe, children of very exceptional special ability). The search is being confined in the main to the grades from 3 to 8 inclusive. Entire cities and counties are being taken in order to avoid, as far as possible, undesirable selection. A certain amount of arbitrary selection is, however, unavoidable. This would be true even if it were possible to give a mental test to all the children in the territory covered, for the test itself is of course an arbitrary criterion. Since it is not possible to test all, additional selection is necessary. At present we are testing in each classroom (by the National Intelligence Tests) the three children who are rated by the teacher as the bright-

est, second brightest, and third brightest, respectively, and in addition the child who is youngest. Those who test in the top 5 per cent for their ages by the National are then given either an abbreviated or a complete Binet, according to the promise shown. Of our cases to date who test above 140, about one third were not nominated as brightest, second brightest, or third brightest, and were caught only by virtue of being youngest.

Notwithstanding the use of such an inclusive drag-net method we have found by sheer accident a number of high I.Q.'s which it had failed to catch. In one case, the youngest child was at home, because of broken glasses, and the teacher substituted the second youngest, not otherwise nominated. This was the only pupil in the room who tested above 140. Another pupil brought to the test by mistake, by a child messenger, tested 149. Another, who was the only child to qualify in a school of 500, was erroneously named by the teacher as youngest as a result of his name appearing alphabetically adjacent to that of the youngest and being confused with it. Of four cases above 170 I.Q. located by one assistant, not one was named as first choice by the teacher. Two of the four were not named as first, second, or third choice and would have been missed but for the fact that they were youngest. It is no wonder that in the old-time school with its narrow curriculum and untrained teachers, the genius often escaped notice as completely as if he had worn an invisible cap. A pupil nominated by one of our teachers as brightest, was a ten-year-old in the first grade with I.Q. considerably below 100. By testing all the children in certain of the smaller cities, after the nominations have been regularly made, we are now trying to get a line on the number who are missed by the usual method of selection.

No results have been worked up, but the following miscellaneous facts may be of interest.

(1) The ratio of boys to girls is now only about 55 to 45, and, as before, is slightly higher in the upper I.Q. ranges.

(2) The individual schools of a given city differ enormously in the proportion of children who are gifted to the required degree. The average number with I.Q. above 140 is, in the larger cities of California, about 1 pupil in 250.

(3) The proportion of Jewish children is even larger than in our earlier data.

(4) Several of our new cases are of very inferior social status and a few are living in extreme poverty. Several have grown up with a minimum of home supervision and training. C. M., for example, (I.Q. 141) is the son of a common Mexican laborer. B. S., who tests at 154, has lived most of his life with his mother, who is feeble-minded by test. One of his sisters is insane, another is feeble-minded, and two others are decidedly subnormal.

Our present undertaking, laborious as it is, will at best only help to open the field. Minute studies will have to be made of a large variety of individual cases. More searching and detailed information will have to be collected on health and heredity. The non-intellectual traits will have to be explored by methods which do not yet exist. Special intellectual abilities will have to be investigated. The pedagogy of genius offers unknown worlds to explore. The science of biography, as a special branch of psychology, is still to create.

Until our knowledge of the social significance of genius has been made more exact, our conception of democracy will remain an illogical patch-work. Until an appreciation of the extent and meaning of individual differences has become more general, the eugenics movement will remain a futile hobby of a handful of enthusiasts, the present unfavorable differential birth rate will continue, and for want of creative thinkers and doers, the struggle of civilization will be, not to advance, but to hold its own against a relatively increasing spawn of inferior mentality.

A PRACTICAL DEFINITION OF CHARACTER

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A certain emphasis placed by recent students of character upon definite aspects of human organization is worthy of note, inasmuch as it represents one of those growths of a definition through the conveniences of practice which could never be achieved through distinctions conferred by theory. Though there is still some divergence of views among active students, character is clearly coming to mean something very distinct in experimental psychology. The growing definition may be arbitrary and difficult to maintain in some situations, but its recognition is imposed upon those who wish to critically judge the investigations of this nature which are accumulating.

If indulgence in favorable comparisons be permitted, two common views regarding character can be briefly mentioned without delaying the progress of thought on the subject.

First is the familiar literary description which should be recalled before it is forsaken. Probably it is most clearly represented by a short summary in a recent volume by Platt (The Psychology of Thought and Feeling, p. 70): "The disposition we have found is the sum of our innate tendencies. The temperament is the result of our nervous, glandular, and other organic vitalities. *The character is the sum of the innate dispositions plus the physiologically determined temperament, plus the sum of all the acquired tendencies.* It is the product of the interaction of the disposition and temperament with the environment."

Another description in Warren's 'Human Psychology' (p. 360), emphasizes the inclusion under character of intellectual attitudes—general modes of receiving and integrating stimuli—as well as of moral, motor, and temperamental

dispositions. Of course, the statement preceding these definitions does not imply that they shall be forsaken because erroneous. In fact they need not be forsaken outside of the laboratory.

Second, is the view of an active student of character, which should not be overlooked because it combines another familiar definition with a definite theory as to the nature of character. In one of his contributions Guy G. Fernald writes under the title, 'Character as an Integral Mentality Function.' (1) His argument convincingly shows how useful such a concept of character becomes to the psychiatrist and for legal and popular usage. The integral function of character fills a significant place in an outline of mentality study; it supplies the responsible element in conduct, for "responsibility is referred to behavior rather than to intention or planning"; it distinguishes the adult personality from that of childhood—"in the child we are less concerned with character than with intellect, whereas in the adult we consider character the more as its dynamics increases." As intelligence is the primary function in thought, so character (moral force, stamina) is the primary function of action. Intelligence is the "thinking, inventing, selecting, combining, planning, deciding function of mentality; character is the emotivating, feeling, sentimental, instinctive, sustaining, energizing, executing or vetoing function of mentality."

Experimentation will ultimately determine whether or not this concept of character as an integral function is theoretically as acceptable as it is practically useful. The other feature of Fernald's definition is of interest here. If Fernald means in the distinction between intelligence and character, just quoted, that character is the sustaining, energizing, or executing factor in all behavior, there is no point in contrasting with his view the one which follows. But Fernald seems to insist upon rectitude as the criterion of character. Not stamina or force receive emphasis, but *moral* force, character *rectitude*. In this regard the definition seems to be fundamentally the same as the popular one summarized in Watson's 'Psychology, from the Standpoint

of a Behaviorist' (page 392); "Character (as distinguished from personality) is generally used when viewing the individual from the standpoint of his reactions to the more conventionalized and standardized situations (conventions, morals, etc.) . . . . Popularly speaking, we would say that a liar and a profligate had no character, but he may have an exceedingly interesting personality." These views imply that force of character makes for moral rectitude, a relation which has not been demonstrated.

The new definition which is to be contrasted with the above, and which has been characterized as a formula growing rapidly to a status of control of experimental work in the field of character, has already appeared in distinct expression. The purpose of the present article is essentially to pick this statement of the definition out of its somewhat obscure setting and to demonstrate its as yet unidentified bearing upon the direction which work on character is taking. In a recent issue of the *Zeitschrift f. Angewandte Psychologie* (2), under the title, *Die experimentelle Gesinnungsprüfung*, Hjalmer Sander has drawn a distinction between what he means by *Gesinnung* (disposition—bent, or direction, of will) and *Charakter* (strength of will). A brief and very free interpretation of his argument is as follows:

"It is this tendency of impulses to run into action, their active strength, which we call character. While the disposition (Gesinnung) is the special object of all moral valuations, character is really removed from considerations of good or bad. For it is not directed toward values but toward the execution according to design of the deeds to which the individual is disposed. The final worth of character lies in its strength, in its persistence, in its constancy. Hence we find surprising strength of character in an individual with a criminal disposition, *i.e.*, Richard III, Cæsar Borgia."

Wallenstein's remark is quoted as fitting: "*Recht hat jeder eigene Charakter, der übereinstimmt mit sich selbst.*" And also Goethe's definition: "*Charakter im grossen und kleinen ist, dass der Mensch demjenigen eine Folge gibt, dessen er sich fähig fühlt.*"

We properly speak of a determined, c onsistent, resolute character, or of character simply, when referring to these qualities in an individual, and on the other hand of a weak, unsteady, vacillating character, or use the word characterless; but in the case of disposition we have no positive or negative designation of that kind—there is no such thing as dispositionlessness (*Gesinnungslosigkeit*). To disposition we more conveniently attach such attributes as refer to worth, as noble, good, pure, clean, sensible, genteel, valorous, or their opposites.

"Using a metaphor, the moral disposition may be compared with the electromotive force and the character as the strength of the current; their electrical efficiency is a product of electromotive force and strength of current; and the effective moral power is a product of the (moral) disposition and the (non-moral) character" (2, pp. 67–68).

The adoption of this point of view is clear in a number of recent studies. Let us begin with the relatively early well-known statistical study of E. Webb under the title, Character and Intelligence (3). It provides an argument in favor of the definition rather than an illustration of its adoption as a guide. For Webb himself gives a definition which includes under character all forms of activity not distinctly intellectual, and he accordingly studies a list of traits comprised of social, moral, and physical traits with those which he regards as intellectual. But the conclusion emphasized by Webb is that the significant force in character, the general factor, is something distinctly in line with what is urged in this new definition. The general factor, acting in the whole range of various traits and determining their interrelations, is the non-moral factor, Persistence of Motives. "For the persistence of a motive in consciousness, and its power to appear in consciousness at any time, even when the field of ideas occupying consciousness at the moment is little, if at all, related to it, seems quite reasonably to be at the base of moral qualities. Trustworthiness, conscientiousness, kindness on principle, fair-play, reliability in friendship, etc., are lessons derived from social education.

These lessons will be learnt more effectively in proportion as they persist long and recur readily" (3, p. 60).

Folsom's similar Statistical Study of Character (4) emphasizes as general factor something on the order of sthenic emotionality or activity, or energy—again without reference to direction or value of its expenditure. Another general factor appeared as persevering intellectuality (interest and effort).

Dr. June E. Downey has contributed a tentative scale for measurement of the volitional pattern (5), which supplies at one sweep a dozen ingenious tests of character traits. Critical evaluation is beyond the purpose of this paper, and therefore the Downey scale must be given strong emphasis here because of its one characteristic, namely because the traits which it attempts to measure are all distinctly of the non-moral kind. In fact the list of traits included in the Downey scale serves as a concrete illustration of the scope of the new definition, with possibly but a few omissions. The traits are: Speed of Movement, Freedom from Inertia, Flexibility, Speed of Decision, Motor Impulsion, Assurance, Motor Inhibition, Resistance, Tenacity, Accuracy, Coördination of Impulses.

Modifications of the Downey scale—one by Downey (6) and another by M. J. Ream (7)—adapting it for group testing, need no special mention except as an indication that work continues along the lines of this definition of character. Recently two more studies of traits from the same list have appeared, totally independent in nature, however, and distinctly experimental: one by Moore and Gilliland on Aggressiveness (8), and the other by R. O. Filter on Self-assurance and Speed of Decision (9).

To summarize briefly: Under the name of character is being ranged for study principally those traits which are of non-moral nature. In the same way that intellectual values have been ruled out of the concept of character and been segregated for separate study, so have æsthetic values been accorded a degree of private consideration, and now moral values also. The emphasis is upon the force of activity

rather than upon its direction, upon the quality of behavior in terms of strength, persistence, readiness, rapidity, etc., rather than upon its value as right or wrong, good or bad, wise or foolish, etc.

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DISCUSSION

CONSCIOUS ANALYSIS, INTROSPECTION, AND BEHAVIORISM

Inasmuch as considerable space in the January number of the REVIEW is devoted to a criticism of my article, 'Conscious Analysis versus Habit Hierarchies in the Learning Process,' I feel justified in calling attention to some points presented in rather misleading fashion by its author, Dr. Crosland. Although the criticism is seemingly a bit personal (perhaps merely literary) in spots, I have no desire to indulge in a personal controversy. And neither do I wish to argue the pros and cons of behaviorism. Two of his specific criticisms, however, directed against the type of evidence which I introduced, and against the behavioristic explanation of the learning process, deserve some comment.

Many people—including the writer—who are interested in psychological science desire a standpoint committed neither to extreme behaviorism not to the traditional view represented by Dr. Crosland. It is at least conceivable that this standpoint calls for a reëxamination and a new definition of the term 'idea,' just as Watson's system includes a new definition of the term 'emotion.' It also demands a careful examination of 'introspection,' 'self-analysis,' 'verbal report,' and related terms. The demand for a unified and scientific psychological system which does justice to the interests of psychiatry, business and industrial psychology, and the study of personality and character (to say nothing of the learning process) need not be argued here. Some of us feel that Dr. Crosland's view is inadequate for this general purpose, and that it is particularly inadequate in its emphasis upon certain alleged introspective phenomena.

It is quiet true that in submitting the evidence furnished by 'untrained' observers I did not follow the precedent established by many who are interested in introspective technique. But it is equally true that intospections offered by trained subjects have been criticized severely by a respectable body of psychologists. I assume, therefore, that the entire question of 'training' is still open to discussion and investigation. It involves, as I suggested

above, the relationship between introspection as ordinarily defined and the process of self-analysis or self-observation. The value of this process, so far as I know, is recognized by all behaviorists, certainly by Watson. I am willing to believe that certain human motives, such as jealousy, ambition for wealth, and hunger can be revealed by this method of self-observation. Furthermore, I am inclined to accept the analyses made by advanced undergraduate university students on such motives. The training required is the training which results in a scientific and impersonal attitude towards the facts of human nature, and the motives which presuppose this attitude for their recognition can be reported by any intelligent adult. If this is introspection, I am more than favorably inclined towards introspection as an essential method in psychological science.

A second group of motives or incentives to overt behavior likewise presents nothing of the mysterious or occult. The average individual of normal intelligence is quite capable of deciding to do this or that, of formulating plans of action for himself. And in general, he is quite capable of distinguishing between premeditated or anticipated acts, on the one hand, and spontaneous acts, on the other. The average lawyer or surgeon, I believe, can be credited with this sort of ability or intelligence. But if such an observer testifies that he did or did not formulate some plan of attack on the situation presented by the Bogardus test his testimony, according to Dr. Crosland, is to be utterly discredited. The introspective data discussed in my article were of this type; they were concerned with and limited to conscious anticipations of overt acts; they involved references to objective and concrete situations. When an adult is asked, on the occasion of a card game, whether or not he deliberately trumped his partner's ace, the same kind of introspection is demanded. And on such an occasion, assuming the intelligence and honesty of the player, we are as likely as not to accept his reply as the truth. The argument that he has not advanced beyond the *Kundgabe* stage would be ignored (or ridiculed) on the basis of common sense.

The question of perceptual control is also raised in Dr. Crosland's criticism. I am quite willing to "consider the students who constitute our first-year, elementary psychology classes, most of whom come into our classes believing that the objects which they see, hear, touch, etc., must really exist in space as they seem to exist." In fact, it was the learning process of such students—save for the

fact that my subjects were advanced—that I attempted to investigate. They certainly accepted the Bogardus apparatus as really existing in space, just as the geologist accepts a rock formation as really existing in space, and they reacted accordingly. Assuming that they were conscious at all, they were probably *conscious of* the motor, the revolving arms, and the black cubes of the apparatus. And since I mentioned specifically the determining elements in the objective learning situation, I disagree with Dr. Crosland in his statement that I had 'very little to say of perception as a control.' Again I find in his criticism the assumption of a mysterious conscious process, unknown to my subjects and unknown to a number of professional psychologists. Was it in their focal or in their marginal consciousness? In all seriousness I submit that the perceptual consciousness of a normal human being may be what it seems to be, that it is characterized by its object-mindedness; and since this is the 'consciousness' which enables him to live in a material world, I wonder why its functional significance should be ignored by Dr. Crosland.

Whether or not my article is 'behavioristic' is largely a matter of appellation. If behaviorism means a standpoint which is objective, and which at the same time recognizes the rôle of an inner mechanism, I undoubtedly committed myself to its tenets in the article criticized by Dr. Crosland. The fact that I recognized this inner mechanism may be gathered from one of my statements, completely ignored by Dr. Crosland: "The considerations submitted in this paper have been to the effect that no anticipatory play of ideas uniformly precedes the selecting, retaining, rejecting, and eliminating activities. When such mental reactions do supervise learning, the process becomes either a reasoned problem, or a step by step reliance upon a formula." But I concluded that the ability to analyze a difficult motor coördination, of the type not easily described by a formula, follows rather than precedes mastery of the coördination itself. Is this conclusion wholly untenable in the light of current psychological theory? If I am not mistaken, it can be harmonized with Woodworth's Law of Combination, as explained in his recent text.

The charge that I omitted tables of results and 'protocols of introspections' should be considered in the light of the general tone of my discussion. My objections to the assumed function of consciousness in learning have been made before by various psychologists, and my introspective reports, supporting these objec-

tions, are summarized, rather than quoted, in my article. Introspections of the kind prized by Dr. Crosland were not included, simply because they were not reported by my subjects. The theory of learning which I advanced, again with no special claims to originality, I definitely characterized as 'suggested by the experimental evidence' but 'offered as an independent consideration.' It is novel only in its attempt to reconcile 'idea' with the accepted facts of habit formation, and to regard an 'idea' as the product of motor activity. I am forced to the conclusion, after studying Dr. Crosland's criticisms, that training in introspection is likely to reflect training in psychological doctrine.

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THE TERM 'PRACTICE'

In an article on "The Meaning of the Term 'Practice'" (this REVIEW, **29**, 1922, 66) Georgina Stickland Gates quotes, as a paragraph from my "Textbook of Psychology," a sentence which (with change of certain adjectival forms and omission of certain indefinite articles) derives from "Experimental Psychology," I., ii., 1901, 226 f. Her discussion of the "Textbook" itself ignores the large-print passages of pp. 537 f., although the paragraph reproduced from the fine print of pp. 538 f. refers to these as "the text." She has also failed to find the passages in "Experimental Psychology," II., ii., 1905, 136, 307, upon which the exposition of the "Textbook" is based. I am afraid it is no wonder that a part of what I say is "not quite clear."

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